Voluntary Remediation Program

Status Report No. 13

Former Estech General Chemical Site

Atlanta, Fulton County, Georgia

Parcels 17-0191-LL0244 and 17-0191-LL0400

HSI Site No. 10196

Prepared for:	BFEL Indemnitor, Inc. Chicago, Illinois
Date:	August 6, 2018
Prepared by:	Wood Environment & Infrastructure Solutions, Inc. 1075 Big Shanty Road NW, Suite 100, Kennesaw, Georgia 30144
Project No.:	6122-08-0154

6 August 2018

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Mr. David Hayes
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Land Protection Branch
Voluntary Remediation Program
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Via: 1 Paper Copy and 2 PDF copies on CD

RE: Voluntary Remediation Plan Status Report No. 13
Former Estech General Chemicals Site - Atlanta, Georgia
HSI Site No. 10196 Parcels 17-0191-LL0244 and 17-0191-LL0400
Wood Project 6122-08-0154

Dear Mr. Hayes:

Wood Environment & Infrastructure Solutions, Inc. (Wood), on behalf of BFEL Indemnitor, Inc. (BFEL), is hereby submitting the attached Status Report No.13 for Voluntary Remediation Program activities for the Former Estech General Chemicals Site in Atlanta, Fulton County, Georgia (HSI Site No. 10196, Tax Parcels 17-0191-LL0244 and 17-0191-LL0400). This status report is required by the Voluntary Remediation Program statute and requested by the Georgia Environmental Protection Division (EPD) in their approval letter dated February 8, 2012. This status report covers the period from February to August 2018. The report includes information on the recent site-wide groundwater and surface water monitoring, further evaluation of the M&J Solvent site VOC plume impact on the Estech site, update of the human health and ecological risk assessments, and status of proposed corrective action. BFEL and Wood would like to meet with EPD in the near term to discuss the recent risk assessment updates and the path forward for the site.

Please review the attached report and contact Greg Wrenn at (770) 421-3472 or greg.wrenn@woodplc.com with any questions you may have and to schedule a meeting.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Rhonda N. Quinn, P.G.
Senior Geologist
Georgia Registration# 1031

Gregory J. Wrenn, P.E.
Associate Engineer/Project Manager
Georgia Professional Engineer # 025565

cc: René Rimelspach, Esq. - ConAgra Foods, Inc. (PDF on CD)
Thomas McGowan, Esq. – McGrath North Mullin & Kratz, PC, LLO (PDF on CD)
Kevin Boland, P.G. - CSX Transportation, Inc. (PDF on CD)
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1.0 PE CERTIFICATION

"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.

Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long-term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division.

The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Gregory J. Wrenn/ Georgia P.E. #25565
Printed Name and GA PE Number

August 6 2018
Date

Signature and Stamp

2.0 INTRODUCTION AND BACKGROUND

This Voluntary Remediation Program Semi-Annual Status Report No. 13 (Status Report) was prepared, on behalf of BFEL Indemnitor, Inc. (BFEL), in accordance with the Voluntary Remediation Program (VRP) for the Former Estech General Chemicals site, Hazardous Site Inventory (HSI) No. 10196/Tax Parcel Parcels 17-0191-LL0244 and 17-0191-LL0400. The Georgia Environmental Protection Division (EPD) requested in their February 8, 2012 approval letter that status reports be submitted in August and February. This thirteenth Status Report covers the activities conducted from February 2018 until shortly before the submittal of this status report (July 2018).

The Former Estech General Chemicals site is located at 1551 Marietta Road in Atlanta, Fulton County, Georgia inside of the Inman Railyards. The CSX Transportation Tilford Yard is within the Inman Railyards and surrounds the Estech property. The site soil and groundwater impacts for site constituents (organochlorine-pesticides, arsenic, lead, and polynuclear aromatic hydrocarbons) were delineated under the Georgia Hazardous Site Response Act (HSRA) and certified to risk reduction standards (RRS). The most recent HSRA Compliance Status Report (CSR) was prepared and submitted October 19, 2007. EPD issued comments on the CSR, dated November 18, 2008. BFEL responded to the comments on February 27, 2009. EPD commented on the responses on December 18, 2009 and requested a Corrective Action Plan (CAP). An initial VRP Application, dated March 18, 2010 and an Addendum, dated March 16, 2011, were submitted to EPD to enter the site into the VRP. The VRP Application and Addendum were submitted in lieu of a HSRA CAP. The VRP Application Addendum contained a revised Voluntary Investigation and Remediation Plan (VIRP) and addressed the EPD VRP Application comment letter dated July 23, 2010. On February 8, 2012, EPD approved the VIRP and accepted the Former Estech General Chemicals site into the VRP. The activities conducted after the date the site was accepted into the VRP have been documented in semi-annual VRP Status Reports.

In accordance with the VIRP, a pilot test was conducted from January 2013 through April 2014 to evaluate the effectiveness of an EHC-M permeable reactive barrier (PRB) to address groundwater impacts. Because the EHC-M injections did not demonstrate that the EHC-M PRB was effective, VRP Status Report No. 5 (August 2014) presented a Revised Remediation Plan. The Revised Remediation Plan proposed a groundwater recirculating system with a limestone infiltration gallery treatment process on the BFEL property in conjunction with a surficial limestone PRB near the seep drainage feature near the unnamed stream on CSX property. A Type 5 RRS was also proposed to address impacted soil via engineering and institutional controls to limit human exposure potential until a viable re-use for the property is identified. The Revised Remediation Plan was discussed with EPD in a meeting on September 18, 2014, and EPD subsequently issued comments on VRP Status Reports Nos. 4 and No. 5 in correspondence dated October 7, 2014

and December 1, 2014. Based upon concerns regarding the groundwater recirculating system potentially exacerbating the spread of the M&J Solvent site's up-gradient volatile organic compound (VOC) plume, BFEL has put that portion of the proposed remedy on hold and is focusing on implementing the surficial PRB in the seep drainage feature. EPD provided comments on VRP Status Reports Nos. 6 through 9 in correspondence dated September 22, 2016 and BFEL responded to those comments in Status Report No. 10. A meeting with BFEL and EPD was held on June 22, 2017 to discuss the path forward for the site and review the conceptual design of the surficial PRB. The conceptual design drawings for the surficial PRB were submitted to EPD in Status Report No. 11. In a letter dated June 29, 2018, EPD provided comments on Status Reports Nos. 10, 11, and 12. Responses to those comments are provided in Appendix E of this report.

3.0 WORK PERFORMED FROM FEBRUARY TO JULY 2018

The activities currently identified to be performed at the Estech site under the VRP are outlined in the VIRP, dated March 16, 2011, the EPD VIRP approval letter dated February 8, 2012, and the EPD VIRP comment letter dated February 8, 2012. The activities conducted from February 2018 through July 2018 include semi-annual groundwater and surface water sampling and analysis, surface soil sampling and analysis, update of the ecological and human health risk assessments, and permitting for the construction of the permeable reactive barrier. These activities are described in the following sections.

3.1 Semi-Annual Groundwater Sampling and Analysis

Groundwater samples were collected from 39 permanent monitoring wells located on the Estech and CSX properties from May 8 through 17, 2018 (Figure 1). The following monitoring wells were sampled:

MW-22	MW-25	MW-26	MW-1B	MW-101	MW-102
MW-104A	MW-104D	MW-105	MW-106D	MW-107D	MW-108
MW-109	MW-110	MW-111	MW-112	MW-113	MW-114
MW-115	MW-116	MW-117	MW-119	MW-120	MW-121
TW-1	TW-2	TW-3	TW-4	TW-5	TW-6
TW-7	TW-8	TW-9	TW-10	TW-11	TW-12
OW-1	OW-2	OW-3			

Well MW-21 was dry and was not sampled in May 2018. The PVC casing for well MW-24 was broken off below the ground surface and could not be sampled. This well will be abandoned in the future. Adjacent well MW-25 screens the same interval as MW-24 and is used to monitor this location. A summary of the groundwater sample data is presented on Table 1. The depth to water was measured in the monitoring wells and the groundwater elevations were calculated. The groundwater elevations are summarized on Table 2 and were used to generate the potentiometric surface map on Figure 2. Groundwater analytical results are summarized on Table 3.

The monitoring wells were purged using low flow/low stress methodology and were sampled following Region 4 USEPA Science and Ecosystem Support Division (SESD) procedure SESDPROC-301-R4. Submersible or peristaltic pumps were used to purge the wells. The depth of water determined which pump type was used. Three well volumes were purged from each well. Water quality parameters pH, conductivity, temperature, turbidity, dissolved oxygen (DO) and oxidation-reduction potential (ORP) were measured and recorded. Groundwater samples were collected after pH, specific conductivity, turbidity, and temperature parameters had

stabilized, and the water was visibly free of sediment (Appendix A). In accordance with SESDPROC-301-R4, the groundwater samples were collected using the submersible and peristaltic pumps. The temporary wells TW-1 through TW-12 are one-inch diameter monitoring wells and are purged and sampled using either a submersible bladder or peristaltic pump, depending on the depth to water below casing. The permanent monitoring wells (MWs) are two-inch diameter wells and were purged and sampled with a submersible Grundfos Redi-Flo2 pump or peristaltic pump. If the depth to water was less than 25 feet, a peristaltic pump was used to purge and sample. The Grundfos pump was used when the depth to water was deeper than 25 feet. The groundwater samples were collected and analyzed for the following constituents:

- Organochlorine pesticides using USEPA Method 8081B
- Arsenic, Lead, Copper, and Zinc using USEPA Method 6020B (total and dissolved analyses)
- Nitrate and Sulfate using USEPA Method 9056A

To further investigate if VOCs from the upgradient M&J Solvents' site are potentially impacting the Estech site, groundwater samples from select monitoring wells were analyzed for VOCs using USEPA method 8260B. The wells sampled and analyzed for VOCs are:

MW-22	MW-25	MW-26	MW-1B	MW-101	MW-102
MW-104A	MW-104D	MW-106D	MW-107D	MW-108	MW-109
MW-110	MW-111	MW-112	MW-113	MW-114	MW-115
MW-116	MW-117	MW-119	MW-120	MW-121	TW-1
TW-2	TW-3	TW-4	TW-5	TW-6	TW-7
TW-8	TW-9	TW-10	OW-1	OW-2	OW-3

3.2 Semi-Annual Surface Water Sampling and Analysis

Eight surface water samples were collected on May 18, 2018 from the un-named stream and seep drainage feature on CSX property. The sample identifications are:

SW-2010-5	SW-2010-10	SW-2010-11	SW-2010-14
SW-2010-15	SW-2010-17	SW2014-20 (seep)	SW2014-21 (seep)

Surface water sample SW-2010-5 was collected in the stream adjacent to well location MW-106D/MW-121. Samples SW-2010-10 and SW-2010-11 were collected from the stream, upstream and downstream, respectively, of the culvert beneath the "pork-barrel" rail line. Samples SW-2010-14, SW-2010-15, and SW-2010-17 were collected in the stream downstream of the culvert and upstream of Marietta Boulevard (Figure 1). Two water samples (SW2014-20 and SW2014-21) were collected in May 2018 from groundwater seepage that discharges to a

drainage feature on the west side of the railroad tracks and upstream of the culvert. The surface water samples were collected by filling the sample containers directly from the stream. The surface water collection data are summarized on Table 1, analytical results are summarized on Table 4, and the laboratory reports are provided in Appendix A. The surface water samples were analyzed for the following constituents:

- Organochlorine pesticides using USEPA Method 8081B
- Dissolved Arsenic, Lead, Copper, and Zinc using USEPA Method 6020B
- Nitrate and Sulfate using USEPA Method 9056A

3.3 Results of the Semi-Annual Groundwater and Surface Water Investigation

The first semi-annual groundwater and surface-water sampling event for 2018 was conducted from May 8 to 18, 2018. The sampling event consisted of measuring the depth to water in monitoring wells, gauging the surface water elevation at four locations along the un-named stream, and sampling and analyzing groundwater samples from monitoring wells and surface water samples from the un-named stream. The interpreted groundwater flow direction and gradients and groundwater and surface water analytical results are discussed below.

3.3.1 Groundwater Flow Direction, Gradients and Velocity

The depth to water was measured in 39 monitoring wells on May 7, 2018 at locations on the Estech and CSX properties. The data were used to generate a potentiometric surface map to evaluate the groundwater flow direction and velocity. The groundwater elevations are summarized on Table 2. The highest elevation was 897.72 feet in well MW-101 and the lowest elevation was 836.47 feet in well MW-107D. The May 2018 groundwater elevations are on average about 1.8 feet higher than the October 2017 elevations and are on average about 0.9 feet higher than the May 2017 groundwater elevations. The higher groundwater elevations in the first half of 2018 are attributed to increased precipitation during the period October 2017 to April 2018, 30.05 inches total rainfall, versus 28.58 inches total rainfall from May to October 2017. Figure 2 is a site potentiometric surface map indicating the groundwater flow direction is from the west side of the Estech property to the east and discharging to the un-named stream.

The horizontal gradient across the site is estimated to be 0.034 to 0.045 feet per foot based on the May 2018 potentiometric map. The groundwater seepage velocity was estimated using an average hydraulic conductivity of 0.84 feet /day or $3x10^{-4}$ cm/sec from the residuum soils based on slug tests performed in monitoring wells MW-1, MW-4, MW-12, DW-2A, and MW-22 and a site-specific effective porosity of the residuum of 0.23. An average seepage velocity through residual soils is calculated to be 0.12 to 0.16 feet per day or 44 to 58 feet per year which is consistent with previous velocities.

The vertical gradients were evaluated in monitoring well pairs MW-104A/MW-104D, MW-110/ MW-111, MW-106D/MW-121, and MW-119/MW-120. The vertical gradients were calculated by dividing the difference in the groundwater elevations by the distance between the mid-points of each well's screen. There was very little difference in the groundwater elevations in well pair MW-104A/MW-104D with a slight upward gradient of 0.007 feet/foot. A downward gradient (0.29 and 0.15 feet/foot) from the residual soil to the fractured bedrock was present at well pairs MW-110/MW-111 and MW-119/MW-120, respectively. There was also a downward gradient (0.5 feet/foot) at well pair MW-106D/MW-121.

The groundwater elevation in well MW-121 (862.85 feet), screening the uppermost fractured bedrock next to the un-named stream was about 0.1 feet higher than the surface water elevation (862.73 feet) in the stream next to the well pair. The groundwater elevation in well MW-106D (843.77 feet), screening a deeper depth in the fractured bedrock was about 18 feet lower than the surface water elevation. The surface water elevation (839.62 feet) at Staff Gauge #3 was about 9 and 7 feet lower, respectively, than the groundwater elevations in well MW-119 (849.35 feet) and the groundwater elevation (847.10 feet) in bedrock well MW-120 which is screened deeper in the fractured bedrock. The groundwater elevation in well MW-107D (836.47 feet), screened just below the soil/bedrock interface, was about 0.3 feet higher than the stream elevation at Staff Gauge #4 (836.20 feet). The data indicate groundwater in the deep residual soil, soil/bedrock interface, and shallow fractured bedrock interact with the stream. Groundwater in the deeper fractured bedrock does not appear to be in communication with the surface water.

3.3.2 Groundwater Analytical Results for Estech Site Constituents

Groundwater samples were collected from the site monitoring wells and analyzed for organochlorine pesticides, total and dissolved arsenic, copper, lead, zinc, total nitrate and sulfate. The BHC isomers were the predominant pesticides detected with beta-BHC being detected most often in the May 2018 samples. Copper and zinc were the predominant metals detected, followed by lead. The dissolved metal concentrations were similar, though generally lower than the total metals concentrations. Nitrate and sulfate were also detected. Monitoring well TW-8 had the highest pesticide concentrations. Well TW-7 had the highest metals. Well TW-7 also had the highest nitrate and sulfate concentrations during the May 2018 event.

The groundwater analytical results are summarized on Table 3, and the laboratory reports are provided in Appendix A. Total copper concentrations ranged from 0.00272 to 124 mg/L while dissolved copper ranged from 0.00216 to 128 mg/L. Total zinc concentrations ranged from 0.0123 to 359 mg/L while dissolved zinc ranged from 0.0157 to 381 mg/L. Well TW-7 had the highest copper and zinc concentrations. Figure 3 presents the metals data for the monitoring wells from May 2018. The metals in groundwater are delineated based on the Type 1 RRS as

shown on Figure 3. The groundwater plume as indicated on Figure 3 is located on the northern and eastern portions of the Estech property and the CSX property abutting the Estech eastern property boundary. The data indicates the lower pH readings generally correlate to higher metals concentrations, particularly copper and zinc. The lower pH groundwater coincides with groundwater metals concentrations that are greater than the Type 1 RRS. The copper and zinc concentrations above the Type 1 RRS are primarily located on the eastern portion of the Estech property and the western portion of the CSX property adjacent to Estech, and north of well MW-117 and south of wells MW-104A/MW-104D. Metals concentrations in groundwater on the western and southern portions of the Estech property and on the eastern portion of the CSX property near the stream are either non-detect or below the Type 1 RRS. Downgradient wells (MW-105, MW-106D, MW-107D, MW-119, MW-120, and MW-121) adjacent to the stream are less than Type 1 RRS. The area with metal concentrations above the Type 1 RRS is bounded by areas that are either non-detect or below the Type 1 RRS. Generally, the surface water concentrations were less than the site groundwater concentrations.

Total and dissolved arsenic and lead were also analyzed in the groundwater samples. Arsenic and lead concentrations were either non-detect or slightly above the Type 1 RRS and were generally less than the copper and zinc concentrations (Table 3). The total arsenic concentrations ranged from 0.00555 to 0.206 mg/L, while the dissolved concentrations ranged from 0.00585 to 0.199 mg/L. The total lead concentrations ranged from 0.00101 to 0.453 mg/L, while the dissolved concentrations ranged from 0.00138 to 0.0187 mg/L. Well MW-109 had the highest arsenic and lead concentrations. The extent of arsenic and lead in groundwater is defined based on Type 1 RRS values (Figure 3). The May 2018 total metals concentrations were lower than the October-November 2017 total metals concentrations.

Pesticides in groundwater are generally delineated based on Type 1 RRS values, as is shown on Figure 4. One to four of the BHC isomers were detected in 27 wells across the site. Alpha-BHC concentrations ranged from 0.000052 to 0.74 mg/L. Beta-BHC concentrations ranged from 0.0001 to 0.078 mg/L. Delta-BHC concentrations ranged from 0.000058 to 2.0 mg/L while gamma-BHC concentrations ranged from 0.000053 to 1.7 mg/L. The May 2018 BHC concentrations were higher than the October-November 2017 concentrations. BHC concentrations in well TW-8 increased from the October-November 2017 sampling event and concentrations were similar to May 2017 and earlier concentrations. Pesticides were detected for the first time in wells TW-10 and TW-11 in November 2015, the wells had been non-detect for the previous five to six sampling events. Wells TW-10 and TW-11 pesticide concentrations were non-detect for the May 2018 sampling event.

DDD, DDE, and DDT were detected at concentrations ranging from 0.00014 to 0.013 mg/L in wells TW-1, TW-8, TW-9, and MW-108 which have a history of these constituents' detections.

DDE was detected for the first time in TW-7 in November 2017, and was non-detect for DDE in May 2018. Dieldrin (0.00012 to 0.004 mg/L) was detected in wells TW-8, TW-9, and MW-111. In May 2018, gamma-chlordane was detected in well TW-8, previously in November 2017 alpha and gamma-chlordane were detected in well TW-8. The May 2018 total pesticide concentrations were higher than the October/November 2017 total concentrations.

Nitrate and sulfate do not have Type 1 RRS because they are not regulated constituents under HSRA or VRP. The extent of nitrate and sulfate in groundwater is shown on Figure 5. The higher sulfate concentrations generally coincide with lower pH values and higher metals concentrations in the groundwater. Nitrate concentrations in May 2018 ranged from 0.27 to 110 mg/L and were higher than the October-November 2017 results. Sulfate concentrations in May 2018 ranged from 28 to 4400 mg/L and were higher than the October/November 2017 results. Wells TW-7, MW-109, and MW-113 had the highest concentrations, respectively.

3.3.3 Groundwater Analytical Results for M&J Solvents' Volatile Organic Compounds

In May 2018, 36 monitoring wells on the Estech and CSX properties were sampled and analyzed for VOCs (Table 5). The sampling was conducted at the request of EPD because of concern that a proposed pump-and-treat remediation could potentially pull the M&J Solvents site VOC groundwater plume toward or onto the Estech property. This is the seventh site-wide sampling for M&J Solvents' VOCs on the Estech site. The purpose of this sampling was to further evaluate the extent of VOCs, previously detected in June 2016 and earlier on the Estech property, from the M&J Solvents site and their potential impact on the construction of an Estech site pump-and-treat groundwater remediation system. Monitoring wells located across the Estech property and wells on the CSX property associated with the Estech pesticide and metals plumes were sampled and analyzed. The May 2018 data indicated the M&J Solvents site VOC groundwater plume was present across the northern third of the Estech property and in the area of well TW-8. Figure 6 indicates the horizontal extent of the VOCs detected in Estech monitoring wells.

As shown on Figure 6, potentiometric surface contours indicate groundwater on the M&J Solvents site is flowing radially to the east, southeast, south, and southwest toward the Estech and CSX properties. The Estech property groundwater flow is from the west to the east toward the stream. The M&J site potentiometric surface contours show groundwater flow toward the unnamed stream and generally toward the northern and western Estech property boundaries. However, there are no groundwater wells or groundwater elevation data from the southern portion of the Whitaker Oil property to confirm the direction of groundwater flow from the southern portion of the Whitaker Oil property in relation to the Estech property. Eighteen VOCs were detected and included benzene, ethylbenzene, toluene, xylenes (BTEX), to chlorinated VOCs (chlorobenzene, chloroform, trichloroethene, tetrachloroethene, cis-1,2-dichloroethene,

tetrahydrofuran, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1-dioxane, naphthalene, and vinyl chloride) to ketones (acetone, 2-butanone and 4-methyl-2-pentanone) (Table 5). Well MW-104D, located on CSX property and sidegradient to the Estech property, but directly downgradient of M&J Solvents, had the highest concentrations of VOCs, including tetrahydrofuran, toluene and xylenes with the ketones comprising the majority of the constituents. Wells MW-113, MW-119, and MW-120, also on CSX property and downgradient of M&J, had elevated VOCs, mostly chlorinated VOCs. Wells MW-22, TW-1, TW-2, and TW-3, located on Estech and downgradient of M&J also had elevated concentrations of chlorinated VOCs (cis-1,2-dichloroethene, trichloroethene, tetrachloroethene, and vinyl chloride). Wells OW-1 to OW-3 were sampled for the fifth time in May 2018 and had low concentrations of chlorobenzene with well OW-2 having the higher concentrations. 1,2,4-Trichlorobenzene was detected in OW-2 and TW-8. The VOC impact to these 13 wells is very likely from the M&J Solvents site.

Wells TW-8, MW-111, OW-1, OW-2, and OW-3 located in the former pond area of Estech had detections of chlorobenzene (0.015 to 1.1 mg/L). Well TW-3 also had a detection of chlorobenzene (0.02 mg/L) and is side gradient to wells TW-8, OW-1 to OW-3, and MW-111. Upgradient wells MW-112, MW-26, and MW-101 did not detect VOCs. There are several wells surrounding TW-8, OW-1 to OW-3 and MW-111 that are non-detect for VOCs (Figure 6). In November 2017, trichloroethene was detected for the first time in bedrock wells MW-110 and MW-121. Trichloroethene was not detected in May 2018 in wells MW-110 and MW-121. In November 2017, there were also first time trichloroethene detections in soil wells MW-22 and MW-108, but trichloroethene was not detected in May 2018 in wells MW-22 and MW-108. VOCs will continue to be monitored to evaluate concentration trends.

3.3.4 Surface Water Analytical Results

Eight surface water samples were collected from the unnamed stream in May 2018 and analyzed for site constituents. The four metals were analyzed for dissolved phase concentrations. BHCs, arsenic, lead, copper, zinc, nitrate, and sulfate were detected. The analytical results are summarized on Table 4. The BHCs ranged in concentrations of alpha-BHC 0.052 to 0.26 µg/L, beta-BHC 0.033J to 1.2 µg/L, delta-BHC 0.024J to 0.21 µg/L, and gamma-BHC 0.035J to 0.11 µg/L based on a laboratory quantitation limit of 0.05 µg/L. Dieldrin was only detected in samples SW2014-20 and SW2014-21 at 0.023J to 0.03J µg/L, respectively. The May 2018 BHC concentrations were higher than the November 2017 concentrations.

The May 2018 dissolved metals concentrations in SW-2010-5, SW-2010-10, SW-2010-17, and SW-2014-21 showed some increase above the November 2017 concentrations. In samples SW-2010-11, SW-2010-14, SW-2010-15, and SW-2014-20 May 2018 concentrations decreased from

November 2017 concentrations. Dissolved arsenic concentrations (0.00211 J to 0.00434 J mg/L) were below the laboratory reporting limit of 0.005 mg/L in the eight samples. Dissolved copper was detected at concentrations ranging from 0.00966 to 0.14 mg/L, and dissolved zinc was detected at concentrations ranging from 0.182 to 3.41 mg/L. Lead concentrations were below the laboratory reporting limit of 0.001 mg/L and below the method detection limit of 0.000621 mg/L in the eight surface water samples in May 2018.

Nitrate was detected at 1.0 to 5.4 mg/L, sulfate was detected at 62 to 200 mg/L, and both increased compared to the November 2017 concentrations. The SW-2014-20 and SW2014-21 samples were collected from water in the drainage feature on the west side of the railroad tracks upstream of the culvert and had higher concentrations for beta and gamma-BHCs, copper and zinc than the four samples collected downstream in the main channel of the unnamed stream. Sample SW-2010-11, immediately downstream of the SW-2014-21 and SW-2014-20 locations, had pesticide and inorganics concentrations that were lower than the other four channel samples collected further downstream.

Dissolved copper and zinc concentrations are greater than the Georgia Instream Water Quality Criteria (ISWQC) for aquatic life receptors (Table 4) and are less than the human health criteria. There is no ISWQC for nitrate and sulfate. Constituent concentrations in samples (SW2010-5 and SW-2010-10) collected upstream of the railroad culvert on the east side of the railroad track are lower than the concentrations of samples (SW2010-11 to SW2010-17) collected downstream of the railroad culvert on the west side of the tracks. The highest concentrations were detected at seep sample locations (SW2014-20 and SW2014-21) and main stream channel surface water samples SW2010-14 to SW2010-17. The drainage feature that branches off the main channel upstream of the culvert on the west side of the tracks has been identified as a point of discharge for elevated concentrations of constituents, particularly zinc. The unnamed stream located on CSX property is not an exposure point for human receptors because the stream is not a source of drinking water, is not accessible to the public, and does not have habitat for a fishery for human consumption. Aquatic receptors are more likely to be exposed to the stream than humans, and as such the aquatic life water quality criteria are the more appropriate criteria.

The concentrations were compared to the ISWQC for aquatic life and human health receptors. Concentrations of alpha and beta-BHCs are greater than the ISWQC for human health exposure. The gamma-BHC concentrations were less than the criteria for human and aquatic exposures. The dissolved arsenic concentrations are below the ISWQC while the copper and zinc are above the ISWQC. As described in Section 3.6, site constituents in the surface water of the un-named stream do not pose unacceptable risk for ecological receptors.

The May 2018 data were also evaluated using concentrations normalized based on annual average stream flow. Appendix B provides an explanation of the evaluation method and the calculations for normalizing the concentrations. The pesticides and arsenic have annual average or higher flow criteria under the Georgia ISWQC. The normalized pesticides concentrations of alpha and beta-BHC, like the un-normalized pesticide concentrations are above the human health criteria of ISWQC. The normalized and un-normalized dissolved arsenic and gamma-BHC concentrations were below the ISWQC. The un-normalized dieldrin concentrations were below the ISWQC.

3.4 Surface Soil Investigation

EPD expressed concern about the Type 5 RRS soil remedy regarding direct exposure to contaminants in surficial soils on the Estech property. Site isolation and the property fence currently limit human access and thereby reduce human exposure to direct contact with site constituents. However, direct exposure to surficial soils by ecological receptors is not controlled. To obtain EPD's approval of the Type 5 remedy, additional surface soil sampling and analysis was conducted to obtain new surficial soil data across the Estech property that is representative of current site conditions. New data were needed because most of the site surficial soil data were from the 1980s and 1990s. The new data were used to update the human health and the screening level ecological risk assessments.

The 18-acre Estech Property was gridded into one-acre sections and eight sampling locations were distributed per each acre. The one-acre sample area is based on using smaller exposure domains to better define areas needing exposure controls to comply with the Type 5 remedy. A surveying team staked the positions of the soil sampling locations to evenly distribute the borings per acre and across the site. On February 6 to 14, 2018, a total of 144 soil borings were sampled across the Estech Property 18-acres. Hand-augers were used to advance the borings from 0 to 1 foot in depth (ecological bioactive interval) and to collect one soil sample per boring. The soil samples were analyzed for the following:

- Site-specific Organochlorine pesticides using USEPA Method 8081A
- Arsenic, Lead, Copper, and Zinc using USEPA Method 6020

Soil samples were shipped under chain-of-custody protocol to AES Analytical in Atlanta, Georgia for analysis. Upon completion of sampling, the boreholes were backfilled with soil previously removed from the boring. The actual sampling locations were staked and surveyed. The laboratory reports are provided in Appendix A.

3.5 Human Health Risk Assessment

As presented in Appendix C, BFEL has completed an investigation to update surficial soil concentrations for a potential Type 5 Risk Reduction Standard (RRS) closure. RRS were previously calculated for soil and groundwater and approved by EPD (February 2015 Status Report). Site groundwater continues to exceed RRS and the intention is to complete an environmental covenant to control the use of groundwater at the site. There is no direct exposure to groundwater at the site. One potential exposure point is a surface stream, which is downgradient and off-property. A permeable reactive barrier is planned to address the groundwater to surface water migration pathway. Because the groundwater pathway is incomplete and will remain incomplete, soil RRS for Type 2 and 4 are based on direct contact only. Soil Type 1 and Type 3 RRS are calculated per the HSRA Rule. These RRS values were compared to the analytical results reported for the soil samples collected during the 2018 sampling event. Surface soil samples were collected at a rate of eight samples per acre to support area averaging into four separate exposure domains (EDs) (Figure HH-1 in Appendix C). Area averages were developed using USEPA ProUCL software to develop domain-specific exposure point concentrations (EPCs).

The potential for Site development is still restricted by limited Site access, i.e., no road access through surrounding properties. A 4.5-acre exposure domain is considered protective of potential future receptors that include industrial/commercial and construction workers (per the approved Site RRS). Per the VRP statute, the use of exposure domains and area averaging techniques were used to evaluate the constituents and media that may result in exposure to receptors through a specified exposure pathway. For Site workers, this includes incidental ingestion, dermal contact, and inhalation of fugitive dust.

Based on the comparison to RRS values presented in Table HH-2 in Appendix C, the primary constituents of concern (COCs) (i.e., reported concentrations greater than the constituents that exceed the highest of the Type 1 through 4 surface soil RRS, which are protective of construction workers) and secondary COCs (i.e., reported concentrations greater than the constituents that exceed the highest of the Type 1 through 3 surface soil RRS), which are protective of industrial/commercial workers, are as follow:

Area 1 – arsenic, lead, beta-BHC, and 4,4'-DDT
Area 2 – arsenic, lead, beta-BHC, dieldrin, and heptachlor
Area 3 – arsenic, lead, beta-BHC, 4,4'-DDT, dieldrin, and heptachlor
Area 4 – arsenic, lead, 4,4'-DDT, and dieldrin

Based on this comparison, Areas 1, 3, and 4 (Figure HH-2 in Appendix C) would require corrective action to be protective of construction workers. All four Areas would require additional action to

be protective of commercial or industrial workers. Arsenic, lead, and 4,4'-DDT are the primary human health COCs. Dieldrin, beta-BHC, and heptachlor are secondary human health COCs that have more limited distribution in surface soils.

Sampling points that were associated with higher concentrations of COCs and were contributing the majority of the risks were identified. This step was accomplished by sorting the data sets from low to high concentrations. Higher concentrations were systematically removed and UCLs (or means for lead) were recalculated repeatedly until the EPC was less than the targeted RRS (Appendix C, Attachments B and C). Based on this evaluation, after corrective action, the surface soil UCL concentrations for 4,4'-DDT, arsenic, beta-BHC, and heptachlor will comply with Type 3 RRS. Surface soil mean concentrations for lead will comply with Type 3 RRS. For Area 2 and 3 EPCs, dieldrin will comply with Type 3 RRS. One sample in Area 1 at a concentration of 2.1 mg/kg and one sample in Area 4 at a concentration of 1.1 mg/kg would exceed the Type 3 RRS for dieldrin of 0.66 mg/kg. However, the site as a whole would have a UCL EPC of 0.22 mg/kg for Dieldrin and would comply with Type 3 RRS. Regardless, dieldrin in all areas will comply with a Type 4 RRS of 27 mg/kg.

3.6 Screening Level Ecological Risk Assessment

A Screening Level Ecological Risk Assessment (SLERA) was initially conducted in 2007 as required under HSRA and updated in 2011 in response to EPD comments on the VRP Application. The 2011 findings indicated the potential for unacceptable risk to ecological receptors from exposure to site surface soils. Exposure to the un-named stream did not present the potential for unacceptable risk to ecological receptors and additional study of the stream was not warranted. Additional ecological risk evaluation was not recommended for site surface soils because site remediation was anticipated to control or remove ecological exposures.

The updated 2018 SLERA presented in Appendix D evaluated the potential environmental risks and/or effects associated with current site conditions on the Estech Property and the un-named stream located on the adjacent CSX railroad property. The un-named stream located on the CSX railroad property is a discharge boundary for site groundwater. The SLERA identified constituents that might pose a hazard to ecological receptors, and evaluates the magnitude of potential adverse impacts to ecological receptors due to exposure to those constituents. The methodology used in the SLERA is presented in Appendix D. The SLERA was conducted in accordance with USEPA's Region 4 Ecological Risk Assessment Supplemental Guidance (USEPA, 2018) and USEPA's Ecological Risk Assessment for Superfund: Process for Designing and Conducting Ecological Risk Assessment (ERAGS; USEPA, 1997).

Surface soil data from the 2018 investigation, existing 2000 and 2004 sediment data, and 2016 through 2018 surface water data from the un-named streamed were used in the update of the SLERA. The findings of the updated SLERA indicated there is the potential for unacceptable risk for terrestrial mammals (shrew) and terrestrial birds (quail) exposed to site surface soil. Comparison of Estech Property surface soil concentrations to ecological Preliminary Remediation

Goals indicates corrective action is required to be protective of ecological receptors. The areas identified under the human health and ecological risk assessments as needing corrective actions to be protective of human health and ecological receptors do overlap (Appendix C, Figure HH-2 and Appendix D, Figures D-5 and D-6). Surface water and/or sediment exposure to site constituents in the un-named stream do not pose unacceptable risk for ecological receptors. Further evaluation of ecological exposure to the un-named stream is not warranted.

3.7 Revised Remediation Approach

BFEL and Amec Foster Wheeler (now Wood) representatives met with EPD representatives on September 18, 2014 to discuss the proposed Revised Remediation Plan presented in VRP Status Report No. 5. The Revised Remediation Plan called for a groundwater recirculating system with a limestone infiltration gallery treatment process. The recirculating system would capture contaminated groundwater, treat the water by raising the pH, and allow the treated water to re-infiltrate back into the subsurface to help flush contaminants in soil and groundwater toward the pumping-induced capture zone while raising the pH in the subsurface soil and groundwater to reduce solubility and mobility of dissolved constituents, particularly zinc. A surficial limestone PRB was also proposed to be installed at the seep area (sample locations SW-2014-20 and SW-2014-21) and drainage feature near the unnamed stream on CSX property. A Type 5 Risk Reduction Standard was proposed to address impacted soil via engineering and institutional controls to limit human exposure potential until a viable re-use for the property is identified. During a June 22, 2017 meeting with EPD, a Type 5 remedy for prevention of exposure to the site soils without a site re-development was discussed. A surface soil investigation was conducted in February 2018 to obtain data representative of current site conditions to evaluate if further corrective actions are needed for implementing the Type 5 remedy based on elimination of human and ecological receptor exposure.

Because implementation of these remedies will extend beyond the VRP five-year time frame, a revised project schedule and potential consent order to replace the existing administrative order were also discussed. A tentative schedule is included as Figure 7.

Previous groundwater sampling has confirmed VOC impacts on the Estech property (Figure 6) and a VOC source has been identified on the upgradient M&J Solvents' site. The VOC source on the M&J site has been treated with air-sparge/soil vacuum extraction while enhanced monitored natural attenuation is being applied to the dissolved-phase groundwater plume downgradient of the M&J Solvents site. M&J Solvents' representatives proposed installing additional wells downgradient of their site on the Estech and CSX properties as part of their on-going step-wise delineation of their groundwater plume. As of this report, M&J Solvents has not installed wells on the Estech property. Implementation of the proposed pump-and-treat system is currently on-hold due to concerns by BFEL and EPD that a pump-and-treat system on the Estech property

could exacerbate the M&J Solvents' VOCs groundwater plume currently impacting the Estech property.

BFEL plans to implement the surficial PRB in the drainage feature and evaluate its performance while keeping the pump-and-treat system on hold. A meeting with BFEL and EPD on June 22, 2017 provided an overview of the conceptual design of the PRB and discussed the path forward for the site. The draft conceptual design drawings for the PRB were submitted to EPD in Status Repot No. 11. From July 2017 to July 2018 the following activities were conducted for the design and construction of the surficial PRB.

- Preparation of the design drawings of the surficial PRB were completed.
- A Pre-Construction Notification (PCN) for coverage under the U.S. Army Corps of Engineers (USACE) Nationwide Permit 38 was submitted in August 2017, and approved by the USACE in correspondence dated October 26, 2017.
- A Stream Buffer Variance Application was submitted to the City of Atlanta in October 2017, and approved in correspondence dated November 8, 2017.
- A Stream Buffer Variance Application was submitted to the Georgia EPD on November 9, 2017.

Initial comments on the Stream Buffer Variance Application were received from EPD in late January 2018, and revisions to address the comments were completed and submitted to CSX on February 9, 2018 because EPD requested that a CSX representative sign the stream buffer variance application as the property owner. In several subsequent communications with Wood, CSX has expressed a willingness to sign the stream buffer variance application and grant access to the property for installation of the surficial PRB. However, as of this report, CSX signature of the variance application is still pending and access to the property to install the surficial PRB has not been granted by CSX.

3.8 CSX Railroad Property

CSX Transportation is in the process of changing their railroad operations at the Tilford Yard. As of May 2018, CSX has removed several of the railroad tracks, including the "pork-barrel" track to the east of the Estech property. The hump yard, at the north end of Tilford Yard, used for sorting and combining trains has been closed. The main line tracks on the west side of Estech remain in-place. CSX is in the process of evaluating re-development or selling the Tilford Yard property.

4.0 WORK TO BE PERFORMED

On-going activities include semi-annual groundwater and surface water monitoring and reporting. Additional activities include implementation of remedial measures previously proposed in light of the upgradient VOC groundwater plume. The sections below describe the status of the activities yet to be performed. Figure 7 is the updated Gantt Chart Schedule of VRP Activities.

4.1 Groundwater and Surface Sampling and Analysis

Groundwater and surface water samples will be collected in October-November 2018 as part of the next semi-annual monitoring event for the site. The following monitoring wells will be sampled and analyzed for site constituents:

MW-22	MW-25	MW-26	MW-1B	MW-101	MW-102
MW-104A	MW-104D	MW-105	MW-106D	MW-107D	MW-108
MW-109	MW-110	MW-111	MW-112	MW-113	MW-114
MW-115	MW-116	MW-117	MW-119	MW-120	MW-121
TW-1 to TW-12		OW-1 to OW-3			

Constituents to be analyzed: Organochlorine Pesticides, Total and Dissolved Metals (Arsenic, Lead, Copper, Zinc), Nitrate, and Sulfate, and VOCs.

Surface Water Sampling and Analysis

Eight surface water locations in the unnamed stream located on CSX property will be sampled and analyzed for the site constituents:

SW2010-5 SW2010-10 SW2010-11 SW2010-14 SW2010-15 SW2010-17
SW2014-20 SW2014-21

Constituents analyzed: Organochlorine Pesticides, Dissolved Metals (Arsenic, Lead, Copper, and Zinc), Nitrate, and Sulfate.

4.2 Surficial Permeable Reactive Barrier

As described in Section 3.7, the design of the surficial PRB has been completed, permitting is in progress, and BFEL continues to work with CSX for access to construct the PRB and execute the stream buffer variance application. After completing the permitting process and obtaining access permission from CSX, BFEL plans to proceed with installation of the surficial limestone PRB to evaluate the efficacy of the limestone/pH adjustment treatment concept. An estimated schedule in included as Figure 7. It is estimated to take approximately a year following installation to evaluate the performance of the surficial PRB and its effects on surface water quality. As discussed in the June 2017 meeting with EPD, an extension to the initial 5-year VRP implementation period is

necessary due to the changing remediation plans, changing property conditions, and up-gradient impacts from M&J Solvents.

Evaluation of corrective actions for a potential Type 5 RRS remedy to control exposure to surface soils on the Estech Property will be conducted.

5.0 PROFESSIONAL SERVICES HOURS THIS PERIOD

Approximately 964.1 professional service hours have been provided by Wood from January 27, 2018 to June 15, 2018. A table of the breakdown of Wood's hours by month along with a description of the services provided is presented on Table 6. The registered professional engineer responsible for implementation of the VRP at this site is Mr. Gregory Wrenn. Mr. Wrenn has personally charged 29.0 labor hours to the project to direct and review the various aspects of implementation of the VRP during this period.

TABLES

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MEDIA: GROUNDWATER						
TW-1	23.0	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2012	New well to investigate Copper and Zinc in groundwater
TW-1	23.0 24.9 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/29/2013	site-wide groundwater monitoring
TW-1	23.0 24.9 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/13/2013	site-wide groundwater monitoring
TW-1	23.0 24.9 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/14/2014	site-wide groundwater monitoring
TW-1	23.0 24.9 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/12/2014	site-wide groundwater monitoring
TW-1	23.0 24.9 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	5/28/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-1	23.0 24.6 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-1	23.0 24.6 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	6/2/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-1	23.0 25.0 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-1	23.0 25.0 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	5/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-1	23.0 25.2 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/1/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-1	23.0 25.2 btoc	890.8/893.00	12.5-22.5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	5/9/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-2	27.2	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2012	New well to investigate Copper and Zinc in groundwater
TW-2	27.2 29.2 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/29/2013	site-wide groundwater monitoring
TW-2	27.2 29.1 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/14/2013	site-wide groundwater monitoring
TW-2	27.2 29.1 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/14/2014	site-wide groundwater monitoring
TW-2	27.2 29.1 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/12/2014	site-wide groundwater monitoring
TW-2	27.2 29.1	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	5/28/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-2	27.2 29.1 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-2	27.2 29.1 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	6/2/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
TW-2	27.2 29.0 btoc	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
TW-2	27.2	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.0 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-2	27.2	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-2	27.2	895.5/897.89	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/11/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	5/30/2013	site-wide groundwater monitoring
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	11/14/2013	site-wide groundwater monitoring
	39.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	39.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring
	39.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	6/15/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of VOCs
	39.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	11/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	40.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-3	36.6	893.9/897.44	26.4-36.4	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	40.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	5/30/2013	site-wide groundwater monitoring
	33.6 btoc			Pesticides		
				Nitrate and Sulfate		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	11/15/2013	site-wide groundwater monitoring
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	5/29/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

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TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	11/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-4	32.3	897.2/899.36	21.8-31.8	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	5/30/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	5/29/2013	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	11/15/2013	site-wide groundwater monitoring
	29.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide groundwater monitoring
	32.5 btoc			Pesticides		
				Nitrate and Sulfate		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide groundwater monitoring
	31.5 btoc			Pesticides		
				Nitrate and Sulfate		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	31.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	6/1/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	31.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	11/13/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	5/5/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	11/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-5	30.0	888.8/891.90	19.8-29.8	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	5/30/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	5/29/2013	site-wide groundwater monitoring
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide groundwater monitoring
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	11/14/2014	site-wide groundwater monitoring
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	6/1/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	11/11/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	40 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	5/5/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	40 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	11/6/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	40.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-6	37.9	905.8/908.34	27.7-37.7	Total and Dissolved As, Cu, Pb, and Zn	5/16/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	40.14 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	6/1/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	5/28/2013	site-wide groundwater monitoring
	32.3 btoc			Pesticides		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	11/19/2013	site-wide groundwater monitoring
	32.3 btoc			Pesticides		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	5/22/2014	site-wide groundwater monitoring
	32.3 btoc			Pesticides		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.3 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	6/5/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of Metals in GW
	32.3 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	11/17/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.2 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.2 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	11/11/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.3 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.3 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	11/7/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.6 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		
TW-7	31.0	897.9/899.22	20.8-30.8	Total and Dissolved As, Cu, Pb, and Zn	5/16/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.5 btoc			Pesticides		
				Site-Specific VOCs		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
TW-8	29.2	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-8	29.2	899.3/900.36	19-29	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	1/21/2013	site-wide groundwater monitoring and parameters for EHC injection pilot study Base line sampling prior to EHC injection
				Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
TW-8	29.5	899.3/900.36	19-29	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	4/15/2013	site-wide groundwater monitoring and parameters for EHC injection pilot study 1st quarter sampling after EHC injection
				Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
TW-8	29.5	899.3/900.36	19-29	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	7/16/2013	site-wide groundwater monitoring and parameters for EHC injection pilot study 2nd quarter sampling after EHC injection
				Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
TW-8	29.5	899.3/900.36	19-29	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	10/9/2013	site-wide groundwater monitoring and parameters for EHC injection pilot study 3rd quarter sampling after EHC injection
				Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
TW-8	29.5	899.3/900.36	19-29	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	1/8/2014	site-wide groundwater monitoring and parameters for EHC injection pilot study 4th quarter sampling after EHC injection
				Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Carbon		
				Total Alkalinity		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	5/19/2014	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	11/14/2014	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	6/2/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of Pesticides
				Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	11/13/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
				Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
				Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	11/14/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	5/8/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	11/6/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	31.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-8	29.9	899.3/900.36	19-29	Total and Dissolved As, Cu, Pb, and Zn	5/16/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	31.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	5/28/2013	site-wide groundwater monitoring
	35.0 btoc			Pesticides		
				Nitrate and Sulfate		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	5/22/2014	site-wide groundwater monitoring
	34.5 btoc			Pesticides		
				Nitrate and Sulfate		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	11/17/2014	site-wide groundwater monitoring
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	6/8/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	11/17/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	11/14/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	5/8/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	34.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	11/6/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-9	33.2	899.2/901.56	23-33	Total and Dissolved As, Cu, Pb, and Zn	5/16/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	5/24/2013	site-wide groundwater monitoring
	30.0 btoc			Pesticides		
				Nitrate and Sulfate		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	29.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	5/22/2014	site-wide groundwater monitoring
	29.4 btoc			Pesticides		
				Nitrate and Sulfate		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	11/17/2014	site-wide groundwater monitoring
	29.4 btoc			Pesticides		
				Nitrate and Sulfate		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	5/31/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	11/17/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	30.0 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	30.0 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	11/14/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	30.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	30.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	11/7/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	30.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-10	29.4	895.6/896.56	19.2-29.2	Total and Dissolved As, Cu, Pb, and Zn	5/17/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	30.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	5/23/2013	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	44.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	5/13/2014	site-wide groundwater monitoring
	44.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	11/11/2014	site-wide groundwater monitoring
	44.8 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	5/27/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	45.03 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	6/1/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	45.03 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring
	44.7 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	5/3/2017	site-wide groundwater monitoring
	44.7 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	11/1/2017	site-wide groundwater monitoring
	45.1 btoc			Pesticides		
				Nitrate and Sulfate		
TW-11	42.0	914.7/918.08	31.8-41.8	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring
	45.1 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	5/31/2012	New well to investigate Copper and Zinc in groundwater
				Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	5/23/2013	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	11/12/2013	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	5/13/2014	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	11/11/2014	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	5/27/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	45.05 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	6/1/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	5/3/2017	site-wide groundwater monitoring
	44.9 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	10/31/2017	site-wide groundwater monitoring
	45.1 btoc			Pesticides		
				Nitrate and Sulfate		
TW-12	44.0	927.6/929.03	33.8-43.8	Total and Dissolved As, Cu, Pb, and Zn	5/9/2018	site-wide groundwater monitoring
	45.1 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	11/13/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	5/21/2013	site-wide groundwater monitoring
	32.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	11/12/2013	site-wide groundwater monitoring
	32.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	5/13/2014	site-wide groundwater monitoring
	32.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	11/11/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.46 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	5/27/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.46 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	11/10/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.17 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	6/1/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.17 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.17 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	5/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.17 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	10/31/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-1B	30.0	913.5/915.95*	20-29	Total and Dissolved As, Cu, Pb, and Zn	5/8/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/14/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/22/2013	site-wide groundwater monitoring
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/19/2014	site-wide groundwater monitoring
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/12/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/29/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	28.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	11/1/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-22	27.0	894.23	17-27	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-25	28.0	895.05	18-28	Well Dry Not Sampled	November and May 2012	
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	5/24/2013	site-wide groundwater monitoring
	29.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-25				Well Dry Not Sampled	November 2013 and May 2014	
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring
	29.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	6/2/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	11/13/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	5/10/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-25	28.0	895.05	18-28	Well Dry Not Sampled	11/8/2017	
	29.8 btoc					
MW-25	28.0	895.05	18-28	Total and Dissolved As, Cu, Pb, and Zn	5/17/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	29.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	11/14/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	5/22/2013	site-wide groundwater monitoring
	20.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	20.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	5/14/2014	site-wide groundwater monitoring
	20.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	11/12/2014	site-wide groundwater monitoring
	20.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	5/28/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	20.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	20.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	6/2/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	20.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	21.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	5/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	21.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	11/1/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	21.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-26	19.0	904.99	9-19	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	21.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	11/12/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	5/21/2013	site-wide groundwater monitoring
	27.1 btoc			Pesticides		
				Nitrate and Sulfate		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	11/12/2013	site-wide groundwater monitoring
	27.0 btoc			Pesticides		
				Nitrate and Sulfate		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	5/13/2014	site-wide groundwater monitoring
	26.98 btoc			Pesticides		
				Nitrate and Sulfate		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	11/11/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	27.20 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	5/27/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	27.20 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	11/10/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	26.87 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	6/1/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	26.87 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	26.70 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	5/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	26.70 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	11/1/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	27.70 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-101	25.0	912.55	14.4-24.4	Total and Dissolved As, Cu, Pb, and Zn	5/9/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	27.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	11/13/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	5/21/2013	site-wide groundwater monitoring
	32.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	11/12/2013	site-wide groundwater monitoring
	32.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	5/13/2014	site-wide groundwater monitoring
	32.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	11/11/2014	site-wide groundwater monitoring
	32.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	5/27/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	6/2/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	5/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	32.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	10/31/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-102	31.2	915.19	21.1-30.1	Total and Dissolved As, Cu, Pb, and Zn	5/8/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	5/28/2013	site-wide groundwater monitoring
	39.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2013	site-wide groundwater monitoring
	39.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	5/14/2014	site-wide groundwater monitoring
	39.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	11/12/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	6/1/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.35 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.35 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	5/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	11/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104A	40.0	898.00	30.0-39.5	Total and Dissolved As, Cu, Pb, and Zn	5/9/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	39.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	5/28/2013	site-wide groundwater monitoring
	82.5 btoc			Pesticides		
				Nitrate and Sulfate		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2013	site-wide groundwater monitoring
	82.5 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	82.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	6/3/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of VOCs in GW
	82.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.92 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.92 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	5/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	11/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-104D	80.0	901.59	69.5-79.5	Total and Dissolved As, Cu, Pb, and Zn	5/9/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	82.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	5/21/2013	site-wide groundwater monitoring
	27.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/14/2013	site-wide groundwater monitoring
	27.1 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	5/13/2014	site-wide groundwater monitoring
	27.1 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/14/2014	site-wide groundwater monitoring
	27.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/14/2014	site-wide groundwater monitoring
	27.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring
	26.97 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring
	26.97 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring
	27.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/8/2016	site-wide groundwater monitoring
	27.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring
	27.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	11/3/2017	site-wide groundwater monitoring
	27.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-105	25.0	904.55	14.8-23.8	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring
	27.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	11/15/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	5/29/2013	site-wide groundwater monitoring
	72.8 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	11/15/2013	site-wide groundwater monitoring
	72.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	5/19/2014	site-wide groundwater monitoring
	72.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring
	72.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	6/2/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	72.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	11/13/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	72.74 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-106D	70.0	878.6*	60-69	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	72.74 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-106D	70.0	878.60	60-69	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	72.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-106D	70.0	878.60	60-69	Total and Dissolved As, Cu, Pb, and Zn	5/8/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	72.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-106D	70.0	878.60	60-69	Total and Dissolved As, Cu, Pb, and Zn	11/6/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	72.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-106D	70.0	878.60	60-69	Total and Dissolved As, Cu, Pb, and Zn	5/11/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	74.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	11/19/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
				Pesticides	12/5/2012	confirmation sampling of pesticides
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	5/22/2013	site-wide groundwater monitoring
	49.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	49.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide groundwater monitoring
	49.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring
	49.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	6/1/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	49.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	11/12/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	49.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	6/6/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	49.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	49.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	49.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	11/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	50.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-107D	50.0	857.14	40.0-49.5	Total and Dissolved As, Cu, Pb, and Zn	5/9/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	50.0 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	11/13/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	5/23/2013	site-wide groundwater monitoring
	35.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	35.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	35.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	11/12/2014	site-wide groundwater monitoring
	35.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	5/28/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	36.08 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	6/2/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	36.08 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	36.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	5/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	36.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	11/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-108	34.0	901.91	24-33	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	36.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	11/16/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	5/23/2013	site-wide groundwater monitoring
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	11/15/2013	site-wide groundwater monitoring
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	33.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	6/3/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of Metals in GW Sampled for treatability study of Pesticides in GW
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	6/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	11/7/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-109	31.5	895.90	21.5-30.5	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved Fe and Mn	1/21/2013	Monitor parameters for EHC injection pilot study Base line sampling prior to EHC injection
				Chloride and Nitrite		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	4/16/2013	Monitor parameters for EHC injection pilot study 1st quarter sampling after injection
	78.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	4/16/2013	Monitor parameters for EHC injection pilot study 1st quarter sampling after injection
	78.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	7/16/2013	Monitor parameters for EHC injection pilot study 2nd quarter sampling after injection
	78.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	10/9/2013	Monitor parameters for EHC injection pilot study 3rd quarter sampling after injection
	78.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	1/8/2014	Monitor parameters for EHC injection pilot study 4th quarter sampling after injection
	78.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
MW-110	76.6	900.52	66.5-75.5	Total Alkalinity		
	78.9 btoc			Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	11/12/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	78.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	5/29/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	78.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	79.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	79.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	78.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	5/5/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	78.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	11/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	78.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-110	76.6	900.52	66.5-75.5	Total and Dissolved As, Cu, Pb, and Zn	5/11/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	78.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	11/16/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved Fe and Mn	1/21/2013	Monitor parameters for EHC injection pilot study Base line sampling prior to EHC injection
				Chloride and Nitrite		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	4/17/2013	Monitor parameters for EHC injection pilot study 1st quarter sampling after injection
	46.3 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	7/16/2013	Monitor parameters for EHC injection pilot study 2nd quarter sampling after injection
	46.3 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	10/9/2013	Monitor parameters for EHC injection pilot study 3rd quarter sampling after injection
	46.3 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	1/8/2014	Monitor parameters for EHC injection pilot study 4th quarter sampling after injection
	46.3 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	5/19/2014	site-wide groundwater monitoring
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	6/3/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of Pesticides in GW
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	6/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	11/8/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-111	43.2	900.10	33.2-42.2	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	11/13/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	5/22/2013	site-wide groundwater monitoring
	25.1 btoc			Pesticides		
				Nitrate and Sulfate		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	25.1 btoc			Pesticides		
				Nitrate and Sulfate		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	5/14/2014	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	11/11/2014	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	5/28/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	11/10/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	6/2/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	11/9/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	5/2/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	11/1/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-112	22.0	904.90	12-21	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	25.56 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	11/15/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	5/24/2013	site-wide groundwater monitoring
	43.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	11/15/2013	site-wide groundwater monitoring
	43.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	43.7 btoc			Pesticides		
				Nitrate and Sulfate		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	11/17/2014	site-wide groundwater monitoring
	43.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	6/2/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of Metals in GW
	43.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	43.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	43.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	5/8/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	11/6/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-113	41.6	900.06	31.6-40.6	Total and Dissolved As, Cu, Pb, and Zn	5/14/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	44.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	11/15/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	5/24/2013	site-wide groundwater monitoring
	46 btoc			Pesticides		
				Nitrate and Sulfate		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	11/14/2013	site-wide groundwater monitoring
	45.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	5/15/2014	site-wide groundwater monitoring
	45.95 btoc			Pesticides		
				Nitrate and Sulfate		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring
	45.95 btoc			Pesticides		
				Nitrate and Sulfate		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	6/2/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	45.95 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	45.93 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	45.93 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	5/8/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	11/6/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-114	43.8	892.96	33.8-42.8	Total and Dissolved As, Cu, Pb, and Zn	5/14/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	46.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	11/15/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	5/24/2013	site-wide groundwater monitoring
	21.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	21.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	5/16/2014	site-wide groundwater monitoring
	21.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2014	site-wide groundwater monitoring
	22.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	6/1/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	5/5/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	11/3/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-115	20.5	893.40	10.5-19.5	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	22.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-116	31.6	905.62	21.6-30.6	Well had insufficent amount of water in casing and could not be sampled	11/15/2012	
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	5/23/2013	site-wide groundwater monitoring
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	11/13/2013	site-wide groundwater monitoring
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	5/16/2014	site-wide groundwater monitoring
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	11/12/2014	site-wide groundwater monitoring
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	5/28/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	11/11/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	5/4/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	11/1/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-116	31.6	905.62	21.6-30.6	Total and Dissolved As, Cu, Pb, and Zn	5/14/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	33.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	11/15/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	5/23/2013	site-wide groundwater monitoring
	24.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	11/15/2013	site-wide groundwater monitoring
	24.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	5/19/2014	site-wide groundwater monitoring
	24.9 btoc			Pesticides		
				Nitrate and Sulfate		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	11/17/2014	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	6/2/2015	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	11/16/2015	site-wide groundwater monitoring
	24.98 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	6/3/2016	site-wide groundwater monitoring
	24.98 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	11/10/2016	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	5/5/2017	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	11/3/2017	site-wide groundwater monitoring
	25.3 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-117	22.0	892.42	12-22	Total and Dissolved As, Cu, Pb, and Zn	5/10/2018	site-wide groundwater monitoring
	25.2 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	12/6/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	5/28/2013	site-wide groundwater monitoring
	54.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	54.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide groundwater monitoring
	54.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	6/5/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	11/17/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.43 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	6/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.43 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	11/11/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	11/7/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	54.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-119	52.0	889.8/892.16	36.5-51.5	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	55.1 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	12/7/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	5/28/2013	site-wide groundwater monitoring
	65.8 btoc			Pesticides		
				Nitrate and Sulfate		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	65.8 btoc			Pesticides		
				Nitrate and Sulfate		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide groundwater monitoring
	65.6 btoc			Pesticides		
				Nitrate and Sulfate		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	11/18/2014	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	65.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	6/4/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL Sampled for treatability study of VOCs in GW
	65.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	11/17/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	65.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	6/8/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	65.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	11/11/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	65.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	65.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	11/7/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	66.0 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-120	64.5	890.1/892.44	54-64	Total and Dissolved As, Cu, Pb, and Zn	5/16/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	66.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	12/6/2012	site-wide groundwater monitoring
				Pesticides		
				Nitrate and Sulfate		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	5/29/2013	site-wide groundwater monitoring
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	11/18/2013	site-wide groundwater monitoring
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	5/19/2014	site-wide groundwater monitoring
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	11/13/2014	site-wide groundwater monitoring
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	6/5/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	11/13/2015	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	6/7/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.4 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	11/11/2016	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	5/9/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	11/7/2017	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.6 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
MW-121	35.0	876.9/879.45	22-32	Total and Dissolved As, Cu, Pb, and Zn	5/11/2018	site-wide groundwater monitoring and M&J Solvents site plume impact on BFEL
	35.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
OW-1	40.5	898.7/901.13	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	1/20/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study Base line sampling prior to EHC injection
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	4/15/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 1st quarter sampling after EHC injection
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	7/16/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 2nd quarter sampling after EHC injection
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	10/9/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 3rd quarter sampling after EHC injection
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	1/8/2014	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 4th quarter sampling after EHC injection
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/19/2014	site-wide monitoring
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/3/2015	site-wide monitoring
OW-1	40.5 42.1 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/16/2015	site-wide monitoring
OW-1	40.5 42.1 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	6/8/2016	site-wide monitoring
OW-1	40.5 42.1 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/11/2016	site-wide monitoring
OW-1	40.5 42.1 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	5/10/2017	site-wide monitoring
OW-1	40.5 42.2 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	11/8/2017	site-wide monitoring
OW-1	40.5 43.0 btoc	898.7/901.13	20-40	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Site-Specific VOCs	5/14/2018	site-wide monitoring
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	1/20/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study Base line sampling prior to EHC injection
OW-2	40.5 42.9 btoc	898.5/901.14	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	4/16/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 1st quarter sampling after EHC injection
OW-2	40.5 42.9 btoc	898.5/901.14	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	7/16/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 2nd quarter sampling after EHC injection
OW-2	40.5 42.9 btoc	898.5/901.14	20-40	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn Pesticides Chloride, Nitrate, Nitrite, and Sulfate Total and Dissolved Organic Cabon Total Alkalinity	1/8/2014	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 4th quarter sampling after EHC injection

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	5/20/2014	site-wide monitoring
	42.9 btoc			Pesticides		
				Nitrate and Sulfate		
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	6/3/2015	site-wide monitoring
	42.9 btoc			Pesticides		
				Nitrate and Sulfate		
OW-2	40.5	898.5/901.14	20-40	Pesticides	11/13/2015	site-wide monitoring
	42.61 btoc			Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	6/8/2016	site-wide monitoring
	42.61 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	11/14/2016	site-wide monitoring
	42.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	5/10/2017	site-wide monitoring
	42.5 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	11/8/2017	site-wide monitoring
	42.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-2	40.5	898.5/901.14	20-40	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide monitoring
	43.8 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	1/20/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study Base line sampling prior to EHC injection
				Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	4/16/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 1st quarter sampling after EHC injection
	42.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	7/16/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study
	42.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	10/9/2013	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 3rd quarter sampling after EHC injection
	42.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Fe, Pb, Mn, and Zn	1/8/2014	Observation well downgradient of injection points Monitor parameters for EHC injection pilot study 4th quarter sampling after EHC injection
	42.9 btoc			Pesticides		
				Chloride, Nitrate, Nitrite, and Sulfate		
				Total and Dissolved Organic Cabon		
				Total Alkalinity		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	5/21/2014	site-wide monitoring
	42.9 btoc			Pesticides		
				Nitrate and Sulfate		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	6/8/2015	site-wide monitoring
	42.9 btoc			Pesticides		
				Nitrate and Sulfate		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	11/13/2015	site-wide monitoring
	43.64 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	6/8/2016	site-wide monitoring
	43.64 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	11/14/2016	site-wide monitoring
	43.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	5/10/2017	site-wide monitoring
	43.7 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

WELL SAMPLED	TOTAL BORING AND WELL DEPTH (FT, BGS)	GROUND SURFACE ELEVATION/ TOP OF CASING ELEVATION (FT, NGVD)	SCREENED INTERVAL (FT, BGS)	ANALYSES PER SAMPLE	SAMPLE DATE	PURPOSE
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	11/8/2017	site-wide monitoring
	43.9 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		
OW-3	41.0	899.1/901.47	20.5-40.5	Total and Dissolved As, Cu, Pb, and Zn	5/15/2018	site-wide monitoring
	43.87 btoc			Pesticides		
				Nitrate and Sulfate		
				Site-Specific VOCs		

Notes:

Arsenic, Lead, Copper, Iron, Manganese, and Zinc analyzed using USEPA Method 6020
Pesticides analyzed using USEPA Method 8081A
Nitrate and Sulfate, Chloride and Nitrite analyzed using USEPA Method 9056
As = arsenic, Cu = Copper, Fe = iron, Pb = lead, Mn = Managanese, Zn = zinc
bgs = below ground surface
na or N/A = not applicable
ft = feet

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

SURFACE WATER LOCATION	SURFACE WATER SAMPLE IDENTIFICATION	ANALYSES	SAMPLE DATE	PURPOSE
MEDIA: SURFACE WATER				
SW-2010-5	SW-2010-5	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/16/2012	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2013	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2013	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/15/2016	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW-2010-5	SW-2010-5	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW-2010-10	SW-2010-10	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/16/2012	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2013	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2013	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Hardness	11/15/2016	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW-2010-10	SW-2010-10	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW-2010-11	SW-2010-11	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/16/2012	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2013	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2013	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

SURFACE WATER LOCATION	SURFACE WATER SAMPLE IDENTIFICATION	ANALYSES	SAMPLE DATE	PURPOSE
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/15/2016	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW-2010-11	SW-2010-11	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW-2010-14	SW-2010-14	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/16/2012	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2013	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2013	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/15/2016	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW-2010-14	SW-2010-14	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW-2010-15	SW-2010-15	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/16/2012	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2013	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2013	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

SURFACE WATER LOCATION	SURFACE WATER SAMPLE IDENTIFICATION	ANALYSES	SAMPLE DATE	PURPOSE
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Hardness	11/15/2016	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW-2010-15	SW-2010-15	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW-2010-17	SW-2010-17	Total and Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/16/2012	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/30/2013	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2013	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/15/2016	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW-2010-17	SW-2010-17	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring Sampled for treatability study of Metals and Pesticides in surface water
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/18/2015	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/9/2016	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate Hardness	11/15/2016	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/11/2017	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/9/2017	Surface water quality monitoring
SW2014-20	SW2014-20	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/18/2018	Surface water quality monitoring
SW2014-21	SW2014-21	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	5/20/2014	Surface water quality monitoring
SW2014-21	SW2014-21	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	11/19/2014	Surface water quality monitoring
SW2014-21	SW2014-21	Dissolved As, Cu, Pb, and Zn Pesticides Nitrate and Sulfate	6/4/2015	Surface water quality monitoring Sampled for treatability study of Metals and Pesticides in surface water

TABLE 1: SUMMARY OF GROUNDWATER AND SURFACE WATER COLLECTION DATA

SURFACE WATER LOCATION	SURFACE WATER SAMPLE IDENTIFICATION	ANALYSES	SAMPLE DATE	PURPOSE
SW2014-21	SW2014-21	Dissolved As, Cu, Pb, and Zn	11/18/2015	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
SW-2014-21	SW-2014-21	Dissolved As, Cu, Pb, and Zn	6/9/2016	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
SW-2014-21	SW-2014-21	Dissolved As, Cu, Pb, and Zn	11/15/2016	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
SW-2014-21	SW-2014-21	Dissolved As, Cu, Pb, and Zn	5/11/2017	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
SW-2014-21	SW-2014-21	Dissolved As, Cu, Pb, and Zn	11/9/2017	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
SW-2014-21	SW-2014-21	Dissolved As, Cu, Pb, and Zn	5/18/2018	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
INFLOW-1	INFLOW-1	Dissolved As, Cu, Pb, and Zn	3/31/2014	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
INFLOW-1	INFLOW-1	Dissolved As, Cu, Pb, and Zn	11/19/2014	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
INFLOW-1	INFLOW-1	Dissolved As, Cu, Pb, and Zn	6/4/2015	Surface water quality monitoring Sampled for treatability study of Metals and Pesticides in surface water
		Pesticides		
		Nitrate and Sulfate		
INFLOW-2	INFLOW-2	Dissolved As, Cu, Pb, and Zn	3/31/2014	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
INFLOW-2	INFLOW-2	Dissolved As, Cu, Pb, and Zn	11/19/2014	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		
INFLOW-2	INFLOW-2	Dissolved As, Cu, Pb, and Zn	6/4/2015	Surface water quality monitoring
		Pesticides		
		Nitrate and Sulfate		

Notes:

Arsenic, Lead, Copper, Iron, Manganese, and Zinc analyzed using USEPA Method 6020
Pesticides analyzed using USEPA Method 8081A
Nitrate and Sulfate, Chloride and Nitrite analyzed using USEPA Method 9056
As = arsenic, Cu = Copper, Fe = iron, Pb = lead, Mn = Managanese, Zn = zinc
bgs = below ground surface
na or N/A = not applicable
ft = feet

TABLE 2: SUMMARY OF GROUNDWATER ELEVATIONS

Well Number	Screened Interval (ft NGVD)			Lithology Screened	Top of Casing Elevation (ft., NGVD)	Depth to Ground Water on 1/7/1998 (ft., btoc)	Ground-Water Elevation on 1/7/1998 (ft., NGVD)	Depth to Ground Water on 5/29/1998 (ft., btoc)	Ground-Water Elevation on 5/29/1998 (ft., NGVD)	Depth to Ground Water (ft., btoc) 1/21/2000	Ground-Water Elevation (ft., NGVD) 1/21/2000	Depth to Ground Water (ft., btoc) 11/26/2002	Ground-Water Elevation (ft., NGVD) 11/26/2002
MW-1B	893.5	-	884.5	fine sandy silt to silty fine sand	915.95					28.54	887.41	24.37	891.58
MW-21	885.9	-	875.9	clayey silt to silty clay	905.70	23.92	881.78	22.56	883.14	27.64	878.06	dry	
MW-22	875.3	-	865.3	silty clay and clayey silt	894.23	16.05	878.18	15.68	878.55	19.76	874.47	18.20	876.03
MW-24	874.8	-	864.8	silty clay to clayey silt	897.31	22.73	874.58	21.01	876.30	27.30	870.01	25.24	872.07
MW-25	875.1	-	865.1	silty clay to clayey silt	895.05	24.54	870.51	23.05	872.00	28.59	866.46	27.00	868.05
MW-26	893.5	-	883.5	clayey silt	904.99	7.63	897.36	7.34	897.65	13.08	891.91	8.90	896.09
DW-1B	843.8	-	833.8	bedrock	915.50			31.35	884.15	39.75	875.75	37.75	877.75
MW-101	895.6	-	885.6	silty fine sand	912.55	13.35	899.20	12.73	899.82	18.15	894.40	14.00	898.55
MW-102	892.4	-	883.4	silty fine sand and PWR	915.19	23.2	891.99	22.80	892.39	24.08	891.11	22.00	893.19
MW-104A	868.3		858.8	silty very fine sand	898.00								
MW-104D	829.9	-	819.9	bedrock	901.59	16.31	885.28	15.59	886.00	20.37	881.22	17.08	884.51
MW-105	887.7		878.7	silty fine to medium sand	904.55	12.18	892.37	11.63	892.92	15.11	889.44	12.15	892.40
MW-106D	816.1	-	807.1	bedrock	878.60	11.41	867.19	11.02	867.58	12.73	865.87	11.85	866.75
MW-107D	817.5		808.0	bedrock	857.14								
MW-108	875.8	-	866.8	silty fine sand	901.91			16.73	885.18	21.60	880.31	19.01	882.90
MW-109	872.1	-	863.1	silty fine sand with brick fragments (fill)	895.90			12.16	883.74	16.58	879.32	13.88	882.02
MW-110	831.9	-	822.9	bedrock	900.52	21.61	878.91	21.28	879.24	25.08	875.44	22.90	877.62
MW-111	864.3	-	855.3	silty sand and PWR	900.10			16.26	883.84	20.59	879.51	18.60	881.50
MW-112	890.7	-	881.7	silty very fine sand	904.90			11.64	893.26	17.44	887.46	13.00	891.90
MW-113	866.2	-	857.2	sandy clayey silt	900.06			25.75	874.31	30.03	870.03	28.15	871.91
MW-114	856.8	-	847.8	silty clayey fine sand to silty fine sand	892.96			22.90	870.06	26.83	866.13	25.00	867.96
MW-115	880.5	-	871.5	silty sand with concrete fragments (fill)	893.40			10.90	882.50	14.98	878.42	12.82	880.58
MW-116	881.8	-	872.8	fine sand	905.62			21.97	883.65	31.65	873.97	29.15	876.47
MW-117	878.1	-	868.1	very sandy silt to very silty fine sand	892.42							11.94	880.48
MW-119	853.3	-	838.3	PWR and bedrock	892.16	not installed							
MW-120	836.1	-	826.1	bedrock	892.44								
MW-121	854.9	-	844.9	bedrock	879.45								
TW-1	878.3	-	868.3	sandy silt	893.00								
TW-2	878.5	-	868.5	sandy silt	897.89								
TW-3	867.5	-	857.5	sandy silt	897.44								
TW-4	875.4	-	865.4	sandy silt	899.36								
TW-5	869.0	-	859.0	silty sand	891.90								
TW-6	878.1	-	868.1	silty sand to sandy silt	908.34								
TW-7	877.1	-	867.1	clay to silty fine sand	899.22								
TW-8	880.3	-	870.3	silty sand to sandy silt	900.36								
TW-9	876.3	-	866.3	silt to sandy silt	901.56								
TW-10	876.4	-	866.4	sandy silt	896.56								
TW-11	882.9	-	872.9	sandy silty with rock fragments	918.08								
TW-12	893.8	-	883.8	silty sand with quartz fragments	929.03								
OW-1	878.7	-	858.7	silt to partially weathered rock	901.13	not installed							
OW-2	878.5	-	858.5	silt with quartz veins to partially weathered rock	901.14								
OW-3	878.6	-	858.6	silt with quartz veins to partially weathered rock	901.47								

Surface Water Location	Screened Interval (ft NGVD)			Lithology Screened	Top of Staff Gauge Elevation (ft., NGVD)	Depth to Surface Water on 1/7/1998 (ft.)	Surface Water Elevation on 1/7/1998 (ft., NGVD)	Depth to Surface Water on 5/29/1998 (ft.)	Surface Water Elevation on 5/29/1998 (ft., NGVD)	Depth to Surface Water (ft.) 1/21/2000	Surface Water Elevation (ft., NGVD) 1/21/2000	Depth to Surface Water (ft.) 11/26/2002	Surface Water Elevation (ft., NGVD) 11/26/2002
Upstream Staff Gauge@ MW-106D/MW-121[(1)] [Staff Gauge #1]	NA			un-named stream on CSX	865.80	2.9	862.90	3.10	862.70	Dry at gauge		1.52	864.28
Downstream Staff Gauge at railroad culvert [(1)] [Staff Gauge #2]	NA				858.90	7.9	851.00	8.10	850.80	1.03	857.87	8.65	850.25
Gauge at at well MW-119/MW-120[(1)] [Staff Gauge #3]	NA				841.55	not installed							
Downstream Staff Gauge at well MW-107D[(1)] [Staff Gauge #4]	NA				837.66								

TABLE 2: SUMMARY OF GROUNDWATER ELEVATIONS

Well Number	Screened Interval (ft NGVD)			Lithology Screened	Top of Casing Elevation (ft., NGVD)	Depth to Ground Water (ft., btoc) 8/20/2007	Ground-Water Elevation (ft., NGVD) 8/20/2007	Depth to Ground Water (ft., btoc) 9/20/2007	Ground-Water Elevation (ft., NGVD) 9/20/2007	Depth to Ground Water (ft., btoc) 7/29/2010	Ground-Water Elevation (ft., NGVD) 7/29/2010	Depth to Ground Water (ft., btoc) 9/14/2010	Ground-Water Elevation (ft., NGVD) 9/14/2010
MW-1B	893.5	-	884.5	fine sandy silt to silty fine sand	915.95	28.47	887.48	22.98	892.97	23.60	892.35	26.40	889.55
MW-21	885.9	-	875.9	clayey silt to silty clay	905.70	dry		dry		24.57	881.13	dry	
MW-22	875.3	-	865.3	silty clay and clayey silt	894.23	20.88	873.35			18.16	876.07	19.46	874.77
MW-24	874.8	-	864.8	silty clay to clayey silt	897.31	dry		dry		not measured		24.01	873.30
MW-25	875.1	-	865.1	silty clay to clayey silt	895.05	28.31	866.74	not measured				25.56	869.49
MW-26	893.5	-	883.5	clayey silt	904.99	13.57	891.42	not measured		10.04	894.95	11.75	893.24
DW-1B	843.8	-	833.8	bedrock	915.50	not measured		not measured		34.42	881.08	36.40	879.10
MW-101	895.6	-	885.6	silty fine sand	912.55	18.11	894.44	not measured		15.12	897.43	16.80	895.75
MW-102	892.4	-	883.4	silty fine sand and PWR	915.19	26.17	889.02	not measured		23.58	891.61	24.82	890.37
MW-104A	868.3		858.8	silty very fine sand	898.00	16.73	881.27	not measured		not measured		14.63	883.37
MW-104D	829.9	-	819.9	bedrock	901.59	21.80	879.79	20.77	880.82	not measured		16.77	884.82
MW-105	887.7		878.7	silty fine to medium sand	904.55	15.96	888.59	not measured		not measured		15.00	889.55
MW-106D	816.1	-	807.1	bedrock	878.60	32.90	845.70	33.08	845.52	not measured		25.78	852.82
MW-107D	817.5		808.0	bedrock	857.14	25.63	831.51	26.07	831.07	not measured		22.99	834.15
MW-108	875.8	-	866.8	silty fine sand	901.91	22.50	879.41	not measured		19.69	882.22	21.23	880.68
MW-109	872.1	-	863.1	silty fine sand with brick fragments (fill)	895.90	17.25	878.65	not measured		not measured		15.57	880.33
MW-110	831.9	-	822.9	bedrock	900.52	31.35	869.17	not measured		27.11	873.41	28.31	872.21
MW-111	864.3	-	855.3	silty sand and PWR	900.10	21.86	878.24	not measured		not measured		20.33	879.77
MW-112	890.7	-	881.7	silty very fine sand	904.90	18.13	886.77	not measured		14.31	890.59	16.35	888.55
MW-113	866.2	-	857.2	sandy clayey silt	900.06	30.85	869.21	not measured		not measured		29.21	870.85
MW-114	856.8	-	847.8	silty clayey fine sand to silty fine sand	892.96	26.91	866.05	not measured		not measured		25.14	867.82
MW-115	880.5	-	871.5	silty sand with concrete fragments (fill)	893.40	16.00	877.40	not measured		not measured		15.16	878.24
MW-116	881.8	-	872.8	fine sand	905.62	30.61	875.01	not measured		23.20	882.42	25.44	880.18
MW-117	878.1	-	868.1	very sandy silt to very silty fine sand	892.42	13.91	878.51	not measured		not measured		13.17	879.25
MW-119	853.3	-	838.3	PWR and bedrock	892.16	not installed							
MW-120	836.1	-	826.1	bedrock	892.44								
MW-121	854.9	-	844.9	bedrock	879.45								
TW-1	878.3	-	868.3	sandy silt	893.00								
TW-2	878.5	-	868.5	sandy silt	897.89								
TW-3	867.5	-	857.5	sandy silt	897.44								
TW-4	875.4	-	865.4	sandy silt	899.36								
TW-5	869.0	-	859.0	silty sand	891.90								
TW-6	878.1	-	868.1	silty sand to sandy silt	908.34								
TW-7	877.1	-	867.1	clay to silty fine sand	899.22								
TW-8	880.3	-	870.3	silty sand to sandy silt	900.36								
TW-9	876.3	-	866.3	silt to sandy silt	901.56								
TW-10	876.4	-	866.4	sandy silt	896.56								
TW-11	882.9	-	872.9	sandy silty with rock fragments	918.08								
TW-12	893.8	-	883.8	silty sand with quartz fragments	929.03								
OW-1	878.7	-	858.7	silt to partially weathered rock	901.13	not installed							
OW-2	878.5	-	858.5	silt with quartz veins to partially weathered rock	901.14								
OW-3	878.6	-	858.6	silt with quartz veins to partially weathered rock	901.47								

Surface Water Location	Screened Interval (ft NGVD)	Lithology Screened	Top of Staff Gauge Elevation (ft., NGVD)	Depth to Surface Water (ft., btoc) 8/20/2007	Surface Water Elevation (ft., NGVD) 8/20/2007	Depth to SurfaceWater (ft., btoc) 9/20/2007	Surface Water Elevation (ft., NGVD) 9/20/2007	Depth to Surface Water (ft., btoc) 7/29/2010	Surface Water Elevation (ft., NGVD) 7/29/2010	Depth to Surface Water (ft., btoc) 9/14/2010	Surface Water Elevation (ft., NGVD) 9/14/2010
Upstream Staff Gauge@ MW-106D/MW-121[(1)] [Staff Gauge #1]	NA	un-named stream on CSX	865.80	2.12	860.91	2.13	860.90	not measured		2.1	860.9
Downstream Staff Gauge at railroad culvert [(1)] [Staff Gauge #2]	NA		858.90	8.10	850.52	7.89	850.73	not measured		7.8	850.8
Gauge at at well MW-119/MW-120[(1)] [Staff Gauge #3]	NA		841.55	not installed							
Downstream Staff Gauge at well MW-107D[(1)] [Staff Gauge #4]	NA		837.66								

TABLE 2: SUMMARY OF GROUNDWATER ELEVATIONS

Well Number	Screened Interval (ft NGVD)			Lithology Screened	Top of Casing Elevation (ft., NGVD)	Depth to Ground Water (ft., btoc) May 30-31, 2012	Ground-Water Elevation (ft., NGVD) June 2012	Depth to Ground Water (ft., btoc) 12/7/2012	Ground-Water Elevation (ft., NGVD) 12/7/2012	Depth to Ground Water (ft., btoc) 5/20/2013 & 5/30/2013[2]	Ground-Water Elevation (ft., NGVD) 5/20/2013 & 5/30/2013[2]	Depth to Ground Water (ft., btoc) 11/11-12/2013	Ground-Water Elevation (ft., NGVD) 11/11-12/2013
MW-1B	893.5	-	884.5	fine sandy silt to silty fine sand	915.95	not measured		29.65	886.30	23.93	892.02	24.97	890.98
MW-21	885.9	-	875.9	clayey silt to silty clay	905.70	not measured		dry		dry		dry	
MW-22	875.3	-	865.3	silty clay and clayey silt	894.23	not measured		22.52	871.71	18.35	875.88	19.71	874.52
MW-24	874.8	-	864.8	silty clay to clayey silt	897.31	not measured		damaged		damaged		damaged	
MW-25	875.1	-	865.1	silty clay to clayey silt	895.05	not measured		dry		27.87	867.18	29.20	865.85
MW-26	893.5	-	883.5	clayey silt	904.99	not measured		15.48	889.51	9.30	895.69	10.76	894.23
DW-1B	843.8	-	833.8	bedrock	915.50	not measured		not measured		39.85	875.65	not measured-could not locate	
MW-101	895.6	-	885.6	silty fine sand	912.55	not measured		20.21	892.34	14.68	897.87	15.95	896.60
MW-102	892.4	-	883.4	silty fine sand and PWR	915.19	not measured		26.46	888.73	22.59	892.60	23.95	891.24
MW-104A	868.3		858.8	silty very fine sand	898.00	not measured		17.35	880.65	12.82	885.18	13.53	884.47
MW-104D	829.9	-	819.9	bedrock	901.59	not measured		20.91	880.68	16.52	885.07	17.21	884.38
MW-105	887.7		878.7	silty fine to medium sand	904.55	not measured		17.11	887.44	12.15	892.40	14.65	889.90
MW-106D	816.1	-	807.1	bedrock	878.60	not measured		28.49	850.11	26.85	851.75	26.97	851.63
MW-107D	817.5		808.0	bedrock	857.14	not measured		24.23	832.91	20.49	836.65	21.54	835.60
MW-108	875.8	-	866.8	silty fine sand	901.91	not measured		25.24	876.67	18.91	883.00	20.85	881.06
MW-109	872.1	-	863.1	silty fine sand with brick fragments (fill)	895.90	not measured		20.41	875.49	13.63	882.27	15.76	880.14
MW-110	831.9	-	822.9	bedrock	900.52	not measured		31.63	868.89	26.74	873.78	27.59	872.93
MW-111	864.3	-	855.3	silty sand and PWR	900.10	not measured		24.53	875.57	18.74	881.36	20.29	879.81
MW-112	890.7	-	881.7	silty very fine sand	904.90	not measured		20.12	884.78	12.43	892.47	15.23	889.67
MW-113	866.2	-	857.2	sandy clayey silt	900.06	not measured		32.19	867.87	28.53	871.53	29.64	870.42
MW-114	856.8	-	847.8	silty clayey fine sand to silty fine sand	892.96	not measured		29.20	863.76	26.21	866.75	26.74	866.22
MW-115	880.5	-	871.5	silty sand with concrete fragments (fill)	893.40	not measured		18.46	874.94	13.22	880.18	14.85	878.55
MW-116	881.8	-	872.8	fine sand	905.62	not measured		32.83	872.79	29.25	876.37	29.41	876.21
MW-117	878.1	-	868.1	very sandy silt to very silty fine sand	892.42	not measured		15.54	876.88	12.40	880.02	13.16	879.26
MW-119	853.3	-	838.3	PWR and bedrock	892.16	not installed		42.28	849.88	42.19	849.97	41.51	850.65
MW-120	836.1	-	826.1	bedrock	892.44	not installed		45.47	846.97	45.19	847.25	44.75	847.69
MW-121	854.9	-	844.9	bedrock	879.45	not installed		17.66	861.79	16.35	863.10	16.69	862.76
TW-1	878.3	-	868.3	sandy silt	893.00	16.00	877.00	17.44	875.56	13.86	879.14	15.05	877.95
TW-2	878.5	-	868.5	sandy silt	897.89	22.44	875.45	24.90	872.99	20.48	877.41	21.71	876.18
TW-3	867.5	-	857.5	sandy silt	897.44	26.85	870.59	29.85	867.59	25.21	872.23	25.89	871.55
TW-4	875.4	-	865.4	sandy silt	899.36	27.70	871.66	30.65	868.71	27.14	872.22	26.95	872.41
TW-5	869.0	-	859.0	silty sand	891.90	22.57	869.33	25.28	866.62	21.61	870.29	21.71	870.19
TW-6	878.1	-	868.1	silty sand to sandy silt	908.34	25.71	882.63	29.19	879.15	23.11	885.23	24.17	884.17
TW-7	877.1	-	867.1	clay to silty fine sand	899.22	21.48	877.74	24.59	874.63	18.97	880.25	20.01	879.21
TW-8	880.3	-	870.3	silty sand to sandy silt	900.36	19.98	880.38	23.66	876.70	17.21	883.15	18.85	881.51
TW-9	876.3	-	866.3	silt to sandy silt	901.56	21.49	880.07	24.68	876.88	18.2	883.36	20.15	881.41
TW-10	876.4	-	866.4	sandy silt	896.56	18.35	878.21	21.42	875.14	15.36	881.20	17.45	879.11
TW-11	882.9	-	872.9	sandy silty with rock fragments	918.08	30.75	887.33	33.71	884.37	29.85	888.23	29.58	888.50
TW-12	893.8	-	883.8	silty sand with quartz fragments	929.03	34.80	894.23	37.52	891.51	33.51	895.52	32.99	896.04
OW-1	878.7	-	858.7	silt to partially weathered rock	901.13	not installed				19.97	881.16	19.80	881.33
OW-2	878.5	-	858.5	silt with quartz veins to partially weathered rock	901.14					20.47	880.67	20.37	880.77
OW-3	878.6	-	858.6	silt with quartz veins to partially weathered rock	901.47					20.83	880.64	20.7	880.77

Surface Water Location	Screened Interval (ft NGVD)			Lithology Screened	Top of Staff Gauge Elevation (ft., NGVD)	Depth to Surface Water (ft., btoc) May 30-31, 2012	Surface Water Elevation (ft., NGVD) June 2012	Depth to Surface Water (ft., btoc) 12/7/2012	Surface Water Elevation (ft., NGVD) 12/7/2012	Depth to Surface Water (ft., btoc) 5/30/2013	Surface Water Elevation (ft., NGVD) 5/30/2013	Depth to Surface Water (ft., btoc) 11/19/2013	Surface Water Elevation (ft., NGVD) 11/19/2013
Upstream Staff Gauge@ MW-106D/MW-121[1] [Staff Gauge #1]	NA			un-named stream on CSX	865.80	not measured		3.02	860.01	3.11	862.69	3.86	861.94
Downstream Staff Gauge at railroad culvert [1] [Staff Gauge #2]	NA				858.90	not measured		7.96	850.66	8.05	850.85	7.90	851.00
Gauge at at well MW-119/MW-120[1] [Staff Gauge #3]	NA				841.55	not installed				2.5	839.05	2.21	839.34
Downstream Staff Gauge at well MW-107D[1] [Staff Gauge #4]	NA				837.66					1.64	836.02	1.15	836.51

TABLE 2: SUMMARY OF GROUNDWATER ELEVATIONS

Well Number	Screened Interval (ft NGVD)			Lithology Screened	Top of Casing Elevation (ft., NGVD)	Depth to Ground Water (ft., btoc) 5/12/2014	Ground-Water Elevation (ft., NGVD) 5/12/2014	Depth to Ground Water (ft., btoc) 11/10/2014	Ground-Water Elevation (ft., NGVD) 11/10/2014	Depth to Ground Water (ft., btoc) 5/26-5/27/2015	Ground-Water Elevation (ft., NGVD) 5/26-5/27/2015	Depth to Ground Water (ft., btoc) 11/9/2015	Ground-Water Elevation (ft., NGVD) 11/9/2015
MW-1B	893.5	-	884.5	fine sandy silt to silty fine sand	915.95	22.40	893.55	26.37	889.58	22.96	892.99	23.88	892.07
MW-21	885.9	-	875.9	clayey silt to silty clay	905.70	23.78	881.92	dry		26.01	879.69	dry	
MW-22	875.3	-	865.3	silty clay and clayey silt	894.23	17.40	876.83	20.40	873.83	19.10	875.13	18.33	875.90
MW-24	874.8	-	864.8	silty clay to clayey silt	897.31	damaged		damaged		damaged		destroyed	
MW-25	875.1	-	865.1	silty clay to clayey silt	895.05	could not locate-not measured		28.35	866.70	26.54	868.51	27.99	867.06
MW-26	893.5	-	883.5	clayey silt	904.99	8.13	896.86	12.42	892.57	9.94	895.05	9.69	895.30
DW-1B	843.8	-	833.8	bedrock	915.50	could not locate-not measured		40.04	875.46	38.16	877.34	39.35	876.15
MW-101	895.6	-	885.6	silty fine sand	912.55	13.75	898.80	17.42	895.13	15.23	897.32	14.78	897.77
MW-102	892.4	-	883.4	silty fine sand and PWR	915.19	22.03	893.16	25.08	890.11	23.23	891.96	23.63	891.56
MW-104A	868.3		858.8	silty very fine sand	898.00	12.08	885.92	14.85	883.15	13.24	884.76	13.31	884.69
MW-104D	829.9	-	819.9	bedrock	901.59	15.79	885.80	18.76	882.83	16.94	884.65	16.93	884.66
MW-105	887.7		878.7	silty fine to medium sand	904.55	11.63	892.92	15.38	889.17	12.81	891.74	13.53	891.02
MW-106D	816.1	-	807.1	bedrock	878.60	26.07	852.53	27.42	851.18	25.27	853.33	25.18	853.42
MW-107D	817.5		808.0	bedrock	857.14	19.74	837.40	22.48	834.66	21.62	835.52	21.73	835.41
MW-108	875.8	-	866.8	silty fine sand	901.91	18.03	883.88	22.09	879.82	19.30	882.61	20.49	881.42
MW-109	872.1	-	863.1	silty fine sand with brick fragments (fill)	895.90	12.88	883.02	17.11	878.79	14.25	881.65	14.70	881.20
MW-110	831.9	-	822.9	bedrock	900.52	25.32	875.20	28.76	871.76	26.84	873.68	27.58	872.94
MW-111	864.3	-	855.3	silty sand and PWR	900.10	17.52	882.58	21.46	878.64	18.86	881.24	20.58	879.52
MW-112	890.7	-	881.7	silty very fine sand	904.90	10.98	893.92	17.16	887.74	14.01	890.89	14.48	890.42
MW-113	866.2	-	857.2	sandy clayey silt	900.06	27.24	872.82	30.30	869.76	27.68	872.38	27.83	872.23
MW-114	856.8	-	847.8	silty clayey fine sand to silty fine sand	892.96	24.45	868.51	27.06	865.90	25.18	867.78	25.75	867.21
MW-115	880.5	-	871.5	silty sand with concrete fragments (fill)	893.40	12.11	881.29	15.91	877.49	13.30	880.10	14.14	879.26
MW-116	881.8	-	872.8	fine sand	905.62	25.33	880.29	29.95	875.67	29.05	876.57	30.84	874.78
MW-117	878.1	-	868.1	very sandy silt to very silty fine sand	892.42	10.91	881.51	13.81	878.61	12.08	880.34	13.09	879.33
MW-119	853.3	-	838.3	PWR and bedrock	892.16	41.21	850.95	42.68	849.48	42.31	849.85	41.60	850.56
MW-120	836.1	-	826.1	bedrock	892.44	44.45	847.99	45.12	847.32	44.62	847.82	44.08	848.36
MW-121	854.9	-	844.9	bedrock	879.45	16.31	863.14	17.19	862.26	16.38	863.07	14.41	865.04
TW-1	878.3	-	868.3	sandy silt	893.00	13.05	879.95	15.69	877.31	14.93	878.07	14.13	878.87
TW-2	878.5	-	868.5	sandy silt	897.89	18.93	878.96	22.48	875.41	21.10	876.79	21.30	876.59
TW-3	867.5	-	857.5	sandy silt	897.44	22.52	874.92	26.51	870.93	24.61	872.83	25.45	871.99
TW-4	875.4	-	865.4	sandy silt	899.36	23.61	875.75	27.05	872.31	26.25	873.11	27.42	871.94
TW-5	869.0	-	859.0	silty sand	891.90	18.06	873.84	21.91	869.99	22.03	869.87	21.89	870.01
TW-6	878.1	-	868.1	silty sand to sandy silt	908.34	20.50	887.84	25.53	882.81	22.79	885.55	24.91	883.43
TW-7	877.1	-	867.1	clay to silty fine sand	899.22	16.63	882.59	21.15	878.07	18.66	880.56	20.51	878.71
TW-8	880.3	-	870.3	silty sand to sandy silt	900.36	15.68	884.68	20.03	880.33	17.42	882.94	19.37	880.99
TW-9	876.3	-	866.3	silt to sandy silt	901.56	16.94	884.62	21.39	880.17	18.66	882.90	20.33	881.23
TW-10	876.4	-	866.4	sandy silt	896.56	14.19	882.37	18.62	877.94	16.79	879.77	17.40	879.16
TW-11	882.9	-	872.9	sandy silty with rock fragments	918.08	26.93	891.15	30.41	887.67	29.77	888.31	30.84	887.24
TW-12	893.8	-	883.8	silty sand with quartz fragments	929.03	30.75	898.28	34.25	894.78	33.65	895.38	34.13	894.90
OW-1	878.7	-	858.7	silt to partially weathered rock	901.13	16.98	884.15	21.20	879.93	18.66	882.47	20.45	880.68
OW-2	878.5	-	858.5	silt with quartz veins to partially weathered rock	901.14	17.52	883.62	21.70	879.44	19.10	882.04	20.80	880.34
OW-3	878.6	-	858.6	silt with quartz veins to partially weathered rock	901.47	17.74	883.73	22.00	879.47	19.39	882.08	21.32	880.15

Surface Water Location	Screened Interval (ft NGVD)			Lithology Screened	Top of Staff Gauge Elevation (ft., NGVD)	Depth to Surface Water (ft., btoc) 5/20/2014	Surface Water Elevation (ft., NGVD) 5/20/2014	Depth to Surface Water (ft., btoc) 11/19/2014	Surface Water Elevation (ft., NGVD) 11/19/2014	Depth to Surface Water (ft., btoc) 5/29/2015	Surface Water Elevation (ft., NGVD) 5/29/2015	Depth to Surface Water (ft., btoc) 11/9/2015	Surface Water Elevation (ft., NGVD) 11/9/2015
Upstream Staff Gauge@ MW-106D/MW-121[(1)] [Staff Gauge #1]	NA			un-named stream on CSX	865.80	3.06	862.74	3.14	862.66	3.05	862.75	3.06	862.74
Downstream Staff Gauge at railroad culvert [(1)] [Staff Gauge #2]	NA				858.90	8.03	850.87	8.02	850.88	8.07	850.83	7.59	851.31
Gauge at at well MW-119/MW-120[(1)] [Staff Gauge #3]	NA				841.55	2.35	839.20	2.65	838.90	1.78	839.77	1.41	840.14
Downstream Staff Gauge at well MW-107D[(1)] [Staff Gauge #4]	NA				837.66	1.25	836.41	1.52	836.14	1.44	836.22	1.31	836.35

TABLE 2: SUMMARY OF GROUNDWATER ELEVATIONS

Well Number	Screened Interval (ft NGVD)			Lithology Screened	Top of Casing Elevation (ft., NGVD)	Depth to Ground Water (ft., btoc) 5/31/2016	Ground-Water Elevation (ft., NGVD) 5/31/2016	Depth to Ground Water (ft., btoc) 11/7/2016	Ground-Water Elevation (ft., NGVD) 11/7/2016	Depth to Ground Water (ft., btoc) 5/1/2017	Ground-Water Elevation (ft., NGVD) 5/1/2017	Depth to Ground Water (ft., btoc) 10/30/2017	Ground-Water Elevation (ft., NGVD) 10/30/2017
MW-1B	893.5	-	884.5	fine sandy silt to silty fine sand	915.95	22.55	893.40	26.62	889.33	24.94	891.01	25.40	890.55
MW-21	885.9	-	875.9	clayey silt to silty clay	905.70	23.61	882.09	dry		25.75	879.95	dry	
MW-22	875.3	-	865.3	silty clay and clayey silt	894.23	17.39	876.84	21.23	873.00	18.82	875.41	19.96	874.27
MW-24	874.8	-	864.8	silty clay to clayey silt	897.31	destroyed		destroyed		destroyed		destroyed	
MW-25	875.1	-	865.1	silty clay to clayey silt	895.05	24.60	870.45	28.53	866.52	28.25	866.80	29.08	865.97
MW-26	893.5	-	883.5	clayey silt	904.99	8.84	896.15	13.57	891.42	10.75	894.24	11.88	893.11
DW-1B	843.8	-	833.8	bedrock	915.50	34.80	880.70	40.47	875.03	40.76	874.74	41.28	874.22
MW-101	895.6	-	885.6	silty fine sand	912.55	14.31	898.24	18.21	894.34	16.01	896.54	16.87	895.68
MW-102	892.4	-	883.4	silty fine sand and PWR	915.19	22.69	892.50	26.06	889.13	23.85	891.34	24.58	890.61
MW-104A	868.3		858.8	silty very fine sand	898.00	12.63	885.37	16.00	882.00	14.92	883.08	14.37	883.63
MW-104D	829.9	-	819.9	bedrock	901.59	16.53	885.06	19.67	881.92	18.26	883.33	17.94	883.65
MW-105	887.7		878.7	silty fine to medium sand	904.55	12.45	892.10	15.75	888.80	13.43	891.12	14.75	889.80
MW-106D	816.1	-	807.1	bedrock	878.60	25.60	853.00	27.16	851.44	27.09	851.51	34.35	844.25
MW-107D	817.5		808.0	bedrock	857.14	20.34	836.80	23.35	833.79	20.63	836.51	22.64	834.50
MW-108	875.8	-	866.8	silty fine sand	901.91	18.58	883.33	22.13	879.78	20.42	881.49	21.67	880.24
MW-109	872.1	-	863.1	silty fine sand with brick fragments (fill)	895.90	13.32	882.58	17.75	878.15	15.23	880.67	16.75	879.15
MW-110	831.9	-	822.9	bedrock	900.52	25.80	874.72	29.49	871.03	28.74	871.78	30.59	869.93
MW-111	864.3	-	855.3	silty sand and PWR	900.10	17.85	882.25	22.08	878.02	20.06	880.04	21.18	878.92
MW-112	890.7	-	881.7	silty very fine sand	904.90	12.52	892.38	18.36	886.54	15.12	889.78	16.66	888.24
MW-113	866.2	-	857.2	sandy clayey silt	900.06	27.34	872.72	30.80	869.26	28.78	871.28	29.95	870.11
MW-114	856.8	-	847.8	silty clayey fine sand to silty fine sand	892.96	23.96	869.00	27.05	865.91	26.51	866.45	22.17	870.79
MW-115	880.5	-	871.5	silty sand with concrete fragments (fill)	893.40	12.66	880.74	16.58	876.82	14.33	879.07	15.39	878.01
MW-116	881.8	-	872.8	fine sand	905.62	23.57	882.05	30.16	875.46	31.05	874.57	31.28	874.34
MW-117	878.1	-	868.1	very sandy silt to very silty fine sand	892.42	10.98	881.44	14.42	878.00	12.94	879.48	13.71	878.71
MW-119	853.3	-	838.3	PWR and bedrock	892.16	41.13	851.03	42.78	849.38	42.66	849.50	42.72	849.44
MW-120	836.1	-	826.1	bedrock	892.44	44.20	848.24	45.30	847.14	45.21	847.23	45.24	847.20
MW-121	854.9	-	844.9	bedrock	879.45	16.80	862.65	17.90	861.55	16.46	862.99	17.43	862.02
TW-1	878.3	-	868.3	sandy silt	893.00	13.23	879.77	16.51	876.49	14.33	878.67	15.15	877.85
TW-2	878.5	-	868.5	sandy silt	897.89	18.94	878.95	23.35	874.54	20.91	876.98	22.13	875.76
TW-3	867.5	-	857.5	sandy silt	897.44	22.01	875.43	27.12	870.32	25.51	871.93	26.79	870.65
TW-4	875.4	-	865.4	sandy silt	899.36	21.96	877.40	27.28	872.08	27.65	871.71	28.49	870.87
TW-5	869.0	-	859.0	silty sand	891.90	20.11	871.79	22.00	869.90	22.23	869.67	22.94	868.96
TW-6	878.1	-	868.1	silty sand to sandy silt	908.34	20.63	887.71	26.33	882.01	24.60	883.74	25.44	882.90
TW-7	877.1	-	867.1	clay to silty fine sand	899.22	16.63	882.59	21.89	877.33	20.51	878.71	21.34	877.88
TW-8	880.3	-	870.3	silty sand to sandy silt	900.36	16.09	884.27	20.85	879.51	18.80	881.56	19.95	880.41
TW-9	876.3	-	866.3	silt to sandy silt	901.56	17.63	883.93	22.20	879.36	19.90	881.66	21.14	880.42
TW-10	876.4	-	866.4	sandy silt	896.56	15.02	881.54	19.34	877.22	16.90	879.66	18.30	878.26
TW-11	882.9	-	872.9	sandy silty with rock fragments	918.08	26.02	892.06	31.12	886.96	30.20	887.88	31.13	886.95
TW-12	893.8	-	883.8	silty sand with quartz fragments	929.03	29.52	899.51	35.00	894.03	34.27	894.76	34.65	894.38
OW-1	878.7	-	858.7	silt to partially weathered rock	901.13	17.41	883.72	21.97	879.16	19.95	881.18	21.13	880.00
OW-2	878.5	-	858.5	silt with quartz veins to partially weathered rock	901.14	17.88	883.26	22.45	878.69	20.38	880.76	21.49	879.65
OW-3	878.6	-	858.6	silt with quartz veins to partially weathered rock	901.47	18.12	883.35	22.81	878.66	20.75	880.72	21.87	879.60

Surface Water Location	Screened Interval (ft NGVD)	Lithology Screened	Top of Staff Gauge Elevation (ft., NGVD)	Depth to Surface Water (ft., btoc) 6/1/2016	Surface Water Elevation (ft., NGVD) 6/1/2016	Depth to Surface Water (ft., btoc) 6/1/2016	Surface Water Elevation (ft., NGVD) 6/1/2016	Depth to Surface Water (ft., btoc) 5/2/2016	Surface Water Elevation (ft., NGVD) 5/2/2016	Depth to Surface Water (ft., btoc) 10/31/2017	Surface Water Elevation (ft., NGVD) 10/31/2017
Upstream Staff Gauge@ MW-106D/MW-121[(1)] [Staff Gauge #1]	NA	un-named stream on CSX	865.80	3.08	862.72	3.06	862.74	3.15	862.65	3.11	862.69
Downstream Staff Gauge at railroad culvert [(1)] [Staff Gauge #2]	NA		858.90	8.02	850.88	7.80	851.10	8.00	850.90	7.98	850.92
Downstream Staff Gauge at at well MW-119/MW-120[(1)] [Staff Gauge #3]	NA		841.55	1.88	839.67	1.75	839.80	1.91	839.64	1.98	839.57
Downstream Staff Gauge at well MW-107D[(1)] [Staff Gauge #4]	NA		837.66	1.43	836.23	1.31	836.35	1.60	836.06	1.60	836.06

TABLE 2: SUMMARY OF GROUNDWATER ELEVATIONS

Well Number	Screened Interval (ft NGVD)			Lithology Screened	Top of Casing Elevation (ft., NGVD)	Depth to Ground Water (ft., btoc) 5/7/2018	Ground-Water Elevation (ft., NGVD) 5/7/2018
MW-1B	893.5	-	884.5	fine sandy silt to silty fine sand	915.95	23.57	892.38
MW-21	885.9	-	875.9	clayey silt to silty clay	905.70	24.97	880.73
MW-22	875.3	-	865.3	silty clay and clayey silt	894.23	18.09	876.14
MW-24	874.8	-	864.8	silty clay to clayey silt	897.31	destroyed	
MW-25	875.1	-	865.1	silty clay to clayey silt	895.05	27.19	867.86
MW-26	893.5	-	883.5	clayey silt	904.99	9.45	895.54
DW-1B	843.8	-	833.8	bedrock	915.50	39.46	876.04
MW-101	895.6	-	885.6	silty fine sand	912.55	14.83	897.72
MW-102	892.4	-	883.4	silty fine sand and PWR	915.19	22.74	892.45
MW-104A	868.3		858.8	silty very fine sand	898.00	13.26	884.74
MW-104D	829.9	-	819.9	bedrock	901.59	16.59	885.00
MW-105	887.7		878.7	silty fine to medium sand	904.55	11.90	892.65
MW-106D	816.1	-	807.1	bedrock	878.60	34.83	843.77
MW-107D	817.5		808.0	bedrock	857.14	20.67	836.47
MW-108	875.8	-	866.8	silty fine sand	901.91	18.95	882.96
MW-109	872.1	-	863.1	silty fine sand with brick fragments (fill)	895.90	13.86	882.04
MW-110	831.9	-	822.9	bedrock	900.52	28.70	871.82
MW-111	864.3	-	855.3	silty sand and PWR	900.10	18.80	881.30
MW-112	890.7	-	881.7	silty very fine sand	904.90	13.41	891.49
MW-113	866.2	-	857.2	sandy clayey silt	900.06	28.39	871.67
MW-114	856.8	-	847.8	silty clayey fine sand to silty fine sand	892.96	25.41	867.55
MW-115	880.5	-	871.5	silty sand with concrete fragments (fill)	893.40	13.03	880.37
MW-116	881.8	-	872.8	fine sand	905.62	28.83	876.79
MW-117	878.1	-	868.1	very sandy silt to very silty fine sand	892.42	12.01	880.41
MW-119	853.3	-	838.3	PWR and bedrock	892.16	42.81	849.35
MW-120	836.1	-	826.1	bedrock	892.44	45.34	847.10
MW-121	854.9	-	844.9	bedrock	879.45	16.60	862.85
TW-1	878.3	-	868.3	sandy silt	893.00	13.84	879.16
TW-2	878.5	-	868.5	sandy silt	897.89	20.03	877.86
TW-3	867.5	-	857.5	sandy silt	897.44	24.68	872.76
TW-4	875.4	-	865.4	sandy silt	899.36	26.39	872.97
TW-5	869.0	-	859.0	silty sand	891.90	20.57	871.33
TW-6	878.1	-	868.1	silty sand to sandy silt	908.34	22.69	885.65
TW-7	877.1	-	867.1	clay to silty fine sand	899.22	18.72	880.50
TW-8	880.3	-	870.3	silty sand to sandy silt	900.36	17.23	883.13
TW-9	876.3	-	866.3	silt to sandy silt	901.56	18.33	883.23
TW-10	876.4	-	866.4	sandy silt	896.56	15.46	881.10
TW-11	882.9	-	872.9	sandy silty with rock fragments	918.08	29.05	889.03
TW-12	893.8	-	883.8	silty sand with quartz fragments	929.03	33.16	895.87
OW-1	878.7	-	858.7	silt to partially weathered rock	901.13	18.50	882.63
OW-2	878.5	-	858.5	silt with quartz veins to partially weathered rock	901.14	18.87	882.27
OW-3	878.6	-	858.6	silt with quartz veins to partially weathered rock	901.47	19.20	882.27

Surface Water Location	Screened Interval (ft NGVD)	Lithology Screened	Top of Staff Gauge Elevation (ft., NGVD)	Depth to Surface Water (ft., btoc) 5/8/2018	Surface Water Elevation (ft., NGVD) 5/8/2018
Upstream Staff Gauge@ MW-106D/MW-121[(1)] [Staff Gauge #1]	NA	un-named stream on CSX	865.80	3.07	862.73
Downstream Staff Gauge at railroad culvert [(1)] [Staff Gauge #2]	NA		858.90	7.94	850.96
Gauge at at well MW-119/MW-120[(1)] [Staff Gauge #3]	NA		841.55	1.93	839.62
Downstream Staff Gauge at well MW-107D[(1)] [Staff Gauge #4]	NA		837.66	1.46	836.20

Notes:

ft. = feet
NGVD = National Geodetic Vertical Datum
Monitoring wells MW-1, MW-1A, MW-2 through MW-15, MW-18, MW-19, MW-20, MW-23, MW-27, DW-1A, DW-2A, DW-2B, MW-103A, MW-103D, MW-104, and MW-118 have been
Monitoring wells MW-7, MW-103, MW-106 and MW-107 were not installed.
Monitoring wells MW-5, MW-10, MW-16 and MW-17 could not be located and assumed to have been destroyed.
(1) new staff gauges installed and surveyed on 5/24/2013
(2) Monitoring wells MW-106D, MW-107D, MW-119, MW-120, and MW-121 were remeasured on 5/30/2013 when new staff gauges were surveyed and measured.
2013 Groundwater levels in OW-1, OW-2, and OW-3 were measured on 4/15/2013 and 10/19/2013 as part of the quarterly EHC-M pilot test study (shown under 5/20/2013 and 11/11-12/2013, respectively)

Prepared by: AS 6/7/2018
Checked by: NM 6/8/2018

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**	**TW-1**
Sample Date	*Concentrations*	**5/9/2018**	**11/1/2017**	**5/3/2017**	**11/9/2016**	**6/2/2016**	**11/11/2015**	**5/28/2015**	**11/12/2014**	**5/14/2014**	**11/13/2013**	**05/29/2013**	**05/30/2012**
Metals mg/L													
Total Arsenic	0.01	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.00272**	< 0.002	< 0.002	**0.00259**	<0.002	**0.00499**	**0.00288**	**0.00495**	**0.00312**	**0.00247**	**0.0132**	<0.002
Total Lead	0.015	< 0.001	< 0.001	< 0.001	<0.001	<0.001	**0.00302**	**0.00193**	**0.00102**	**0.00119**	<0.001	**0.0118**	<0.001
Total Zinc	2	**0.303 J**	**0.296**	**0.487**	**0.303**	**0.34**	**0.119**	**0.224**	**0.319**	**0.300**	**0.361**	**0.373**	**0.178**
Dissolved Arsenic	0.01	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	< 0.002	< 0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	**0.0027**	<0.002	<0.002	<0.002	<0.002
Dissolved Lead	0.015	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.359 J**	**0.276**	**0.267**	**0.282**	**0.265**	**0.105**	**0.202**	**0.283**	**0.270**	**0.318**	**0.333**	**0.180**
Total of Total Metals Concentrations		0.30572	0.296	0.487	0.30559	0.34	0.12701	0.22881	0.32497	0.30431	0.36347	0.398	0.178
Total of Dissolved Metals Concentrations		0.359	0.276	0.267	0.282	0.265	0.105	0.202	0.2857	0.27	0.318	0.333	0.180
Inorganics mg/L													
Nitrate	10 (NR)	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**0.29**	<0.25
Sulfate	250 (NR)	**60**	**51**	**59**	**57**	**62**	**31**	**60**	**46**	**63**	**54**	**61**	**60**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	**0.0006**	**0.00057**	**0.00083**	**0.0007**	**0.0012**	**0.0014**	**0.002**	**0.00087**	**0.00054**	**0.00040**	**0.00059**	**0.00042**
4,4´-DDE	0.0001	**0.0006**	**0.00071**	**0.0008**	**0.0008**	**0.00072**	**0.0014**	**0.0019**	**0.0031**	**0.0019**	**0.0013**	**0.0047**	**0.00050**
4,4´-DDT	0.0001	**0.00038**	**0.00048**	**0.00045**	**0.00042**	**0.00015**	**0.0017**	**0.0017**	**0.0052**	**0.0043**	**0.0025**	**0.0037**	**0.00049**
alpha-BHC	0.00005(DL)	**0.00032**	**0.00011**	**0.00037**	<0.0005	**0.00033**	**0.0015**	**0.00053**	**0.0002**	**0.0015**	**0.00041**	**0.00043**	**0.0037**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0039**	**0.00067**	**0.0025**	**0.00033**	**0.0042**	**0.033**	**0.0061**	**0.0041**	**0.018**	**0.0081**	**0.0200**	**0.0087**
delta-BHC	0.00005(DL)	**0.00027**	**0.00011**	**0.0003**	**0.000061**	**0.00031**	**0.0014**	**0.00056**	**0.00023**	**0.0016**	**0.00056**	**0.0013**	**0.00047**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00016**	<0.0001	<0.0001	<0.0001	**0.0017**	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00024**	<0.00005	**0.00037**	<0.00005	**0.0003**	**0.00074**	**0.00033**	**0.00016**	**0.00076**	**0.00025**	**0.00026**	**0.00030**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	**0.0056**	<0.005	<0.005	<0.005
Total Pesticides		0.00631	0.00265	0.00562	0.00231	0.00721	0.04130	0.01312	0.01386	0.03420	0.01522	0.03098	0.01452
pH (std units)		6.59	6.14	6.25	6.0	5.96	6.41	6.01	5.81	5.73	5.92	5.6	6.19
Specific Conductance (mS/cm)		0.275	0.222	0.337	0.361	0.247	0.451	0.283	0.449	0.416	0.445	0.383	0.36
Turbidity (NTUs)		58.3	9.2	9.61	21.4	9.5	>100	9.79	10.7	2	9.81	48.1	0.75
DO (mg/L)		1.08	0.14	0.92	1.06	0.0	1.03	0.3	0.95	1.84	1.09	10.15	
ORP (mV)		68	79	73	138	68	-5	59	-33	114	77	170	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**	**TW-2**
Sample Date	*Concentrations*	**5/11/2018**	**11/2/2017**	**5/4/2017**	**11/9/2016**	**6/2/2016**	**11/12/2015**	**5/28/2015**	**11/12/2014**	**5/14/2014**	**11/14/2013**	**05/29/2013**	**05/30/2012**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.0137**	<0.002
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00445**	<0.001
Total Zinc	2	**0.0123 JB**	<0.0100	<0.0100	<0.01	**0.0428**	<0.01	<0.01	<0.010	<0.010	**0.0102**	**0.0273**	**0.0109**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	<0.0500	<0.0100	<0.0100	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01
Total of Total Metals Concentrations		0.0123	BDL	BDL	BDL	0.0428	BDL	BDL	BDL	BDL	0.0102	0.04545	0.01091
Total of Dissolved Metals Concentrations		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Inorganics mg/L													
Nitrate	10 (NR)	**7.0**	**5.9**	**5.8**	**5.5**	**4.6**	**4.8**	**4.3**	**3.5**	**4.1**	**5.6**	**4.6**	**4.3**
Sulfate	250 (NR)	**94**	**76**	**92**	**69**	**76**	**80**	**84**	**66**	**81**	**93**	**88**	**68**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000070**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00014**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000057**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00044**	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.00054	BDL	0.00026
pH (std units)		5.82	5.71	5.86	5.63	5.31	5.16	5.08	5.51	5.71	5.56	5.43	6.03
Specific Conductance (mS/cm)		0.32	0.232	0.349	0.342	0.249	0.415	0.27	0.412	0.356	0.405	0.386	0.38
Turbidity (NTUs)		0.37	1.7	0	2.8	1.4	0.3	0	1.5	8.5	9.89	9.8	2.27
DO (mg/L)		1.37	0.15	1.2	1.1	0.0	1.3	0.18	0.93	1.43	1.89	5.86	
ORP (mV)		178	231	186	179	213	182	193	-40	135	139	246	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**	**TW-3**
Sample Date	*Concentrations*	**5/15/2018**	**11/2/2017**	**5/4/2017**	**11/10/2016**	**6/3/2016**	**11/12/2015**	**6/5/2015**	**11/13/2014**	**5/15/2014**	**11/14/2013**	**05/30/2013**	**05/31/2012**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.652**	**0.525**	**0.839**	**0.893**	**1.03**	**0.624**	**0.884**	**0.820**	**0.695**	**0.933**	**1.12**	**1.09**
Total Lead	0.015	**0.00245**	**0.00217**	**0.00262**	**0.0026**	**0.00297**	**0.00281**	**0.00544**	**0.00301**	**0.00407**	**0.00499**	**0.00466**	**0.00266**
Total Zinc	2	**1.76**	**1.390**	**2.25**	**2.19**	**2.02**	**1.65**	**2.16**	**2.120**	**1.95**	**2.55**	**2.92**	**2.14**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.663**	**0.506**	**0.669**	**0.68**	**0.611**	**0.646**	**0.724**	**0.842**	**0.672**	**0.845**	**1.05**	**1.01**
Dissolved Lead	0.015	**0.00219**	**0.00203**	**0.00235**	**0.00204**	**0.00216**	**0.00238**	**0.00309**	**0.00308**	**0.00336**	**0.00334**	**0.00346**	**0.00175**
Dissolved Zinc	2	**1.85**	**1.34**	**1.61**	**1.94**	**1.39**	**1.67**	**2.08**	**2.19**	**1.9**	**2.04**	**2.74**	**2.00**
Total of Total Metals Concentrations		2.41445	1.91717	3.09162	3.0856	3.05297	2.27681	3.04944	2.94301	2.64907	3.48799	4.04466	3.231657
Total of Dissolved Metals Concentrations		2.51519	1.84803	2.28135	2.62204	2.00316	2.31838	2.80709	3.03508	2.57536	2.88834	3.79346	3.005752
Inorganics mg/L													
Nitrate	10 (NR)	**1.8**	**1.9**	**3.3**	**2.9**	<5	<12	**38**	**6.2**	**7.4**	**11**	**12**	**9.5**
Sulfate	250 (NR)	**590**	**530**	**630**	**610**	**520**	**600**	**530**	**600**	**600**	**640**	**600**	**550**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0017**	**0.0015**	**0.001500**	**0.0014**	**0.0032**	**0.0016**	**0.001200**	**0.000870**	**0.00095**	**0.00055**	**0.00049**	**0.00063**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0014**	**0.00120**	**0.00150**	**0.0015**	**0.0026**	**0.0015**	**0.00110**	**0.0011**	**0.0012**	**0.00072**	**0.00077**	**0.0010**
delta-BHC	0.00005(DL)	**0.00043**	**0.000380**	**0.000390**	**0.00043**	**0.00095**	**0.00051**	**0.000410**	**0.000360**	**0.00040**	**0.00019**	**0.00017**	**0.00027**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00067**	**0.00063**	**0.0006**	**0.00056**	**0.0013**	**0.00071**	**0.00051**	**0.00035**	**0.00042**	**0.00022**	**0.00021**	**0.00026**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.00420	0.00371	0.00399	0.00389	0.00805	0.00432	0.00322	0.00268	0.00297	0.00168	0.00164	0.00219
pH (std units)		3.72	3.92	3.78	3.87	3.78	3.6	2.49	3.69	4.03	3.75	3.9	4.33
Specific Conductance (mS/cm)		0.86	0.599	1.14	1.05	0.692	1.34	0.958	1.44	1.27	1.49	1.51	1.43
Turbidity (NTUs)		2.07	0.0	0	1.4	8.7	6	4.2	7.7	1.8	9.56	35.5	8.82
DO (mg/L)		1.02	0.02	0.8	1.3	0.0	0.84	0.54	1.88	2.17	0.63	1.38	
ORP (mV)		392	459	419	288	455	367	383	428	227	441	486	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**	**TW-4**
Sample Date	*Concentrations*	**5/15/2018**	**11/3/2017**	**5/4/2017**	**11/9/2016**	**6/3/2016**	**11/12/2015**	**5/29/2015**	**11/13/2014**	**5/15/2014**	**11/15/2013**	**05/30/2013**	**05/31/2012**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.146 J**	**0.185**	**0.186**	**0.166**	**0.167**	**0.134**	**0.149**	**0.166**	**0.166**	**0.234**	**0.127**	**0.139**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00274**	**0.00349**	<0.001	<0.001	<0.001	**0.0116**	<0.001
Total Zinc	2	**0.719 J**	**0.897**	**0.85**	**0.804**	**0.896**	**0.626**	**0.793**	**0.884**	**0.968**	**1.27**	**0.847**	**0.902**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.166 J**	**0.140**	**0.127**	**0.15**	**0.142**	**0.126**	**0.145**	**0.151**	**0.161**	**0.216**	**0.113**	**0.128**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.867 J**	**0.792**	**0.757**	**0.739**	**0.801**	**0.622**	**0.752**	**0.836**	**0.944**	**1.14**	**0.879**	**0.847**
Total of Total Metals Concentrations		0.865	1.082	1.038	0.97	1.063	0.76274	0.94549	1.05	1.134	1.504	0.9856	1.0416
Total of Dissolved Metals Concentrations		1.033	0.932	0.884	0.889	0.943	0.748	0.897	0.987	1.105	1.356	0.992	0.9745
Inorganics mg/L													
Nitrate	10 (NR)	**2.3**	**1.2**	**1.6**	**1.1**	**1.0**	**0.85**	**0.82**	**1.8**	**3.0**	**2.8**	**1.4**	<1.2
Sulfate	250 (NR)	**130**	**120**	**170**	**150**	**160**	**130**	**140**	**160**	**190**	**220**	**190**	**160**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000093**	**0.00012**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0028**	**0.0030**	**0.0034**	**0.0059**	**0.0067**	**0.0086**	**0.0094**	**0.00062**	**0.0077**	**0.0091**	**0.0094**	**0.014**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000085**	**0.00021**	**0.000083**	**0.00021**	**0.00026**	**0.00044**	**0.00092**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	**0.00014**	<0.0001	**0.00019**	**0.00015**	**0.00013**	**0.00011**	**0.00017**	**0.00015**	**0.00026**	**0.00021**
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00013**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.0028	0.00300	0.00354	0.00590	0.00689	0.00884	0.00974	0.00081	0.00808	0.00951	0.01019	0.01545
pH (std units)		4.32	4.37	4.24	4.3	4.33	4.18	4	4.07	4.24	4.34	4.84	4.62
Specific Conductance (mS/cm)		0.263	0.220	0.311	0.332	0.264	0.37	0.268	0.45	0.481	0.564	0.48	0.45
Turbidity (NTUs)		0	4.9	9.71	8.0	4.4	0.5	0	0.0	0.7	8.9	56.6	1.73
DO (mg/L)		1.73	0.69	1.39	1.6	0.0	1.41	1.17	2.79	4.01	2.24	6.03	
ORP (mV)		282	346	276	303	395	327	365	300	219	399	360	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**	**TW-5**
Sample Date	*Concentrations*	**5/15/2018**	**11/3/2017**	**5/5/2017**	**11/10/2016**	**6/3/2016**	**11/13/2015**	**6/1/2015**	**11/13/2014**	**05/21/2014**	**11/15/2013**	**05/29/2013**	**05/30/2012**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0125**	**0.0087**	<0.005
Total Copper	1.3	**1.04 J**	**1.30**	**1.57**	**1.8**	**0.903**	**1.05**	**1.5**	**1.40**	**1.48**	**1.71**	**1.58**	**0.865**
Total Lead	0.015	<0.001	<0.001	**0.00106**	**0.00228**	<0.001	**0.0017**	**0.00149**	**0.0025**	**0.00198**	**0.0716**	**0.0257**	**0.0029**
Total Zinc	2	**15.8**	**13.1**	**14.7**	**16.7**	**7.41**	**8.49**	**33.6**	**17.4**	**14.5**	**18.9**	**11.6**	**13.7**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**1.18 J**	**0.694**	**1.3**	**1.21**	**0.749**	**1.04**	**1.32**	**1.29**	**1.66**	**1.08**	**1.57**	**0.751**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	**0.00196**	<0.001	**0.00118**	**0.00106**	**0.00169**	**0.00228**	**0.00687**	**0.00276**	<0.001
Dissolved Zinc	2	**14.5**	**11.7**	**13.0**	**14.7**	**6.52**	**8.55**	**12.8**	**19.6**	**15.8**	**15.1**	**11.0**	**8.6**
Total of Total Metals Concentrations		16.84	14.4	16.27106	18.50228	8.313	9.5417	35.10149	18.8025	15.98198	20.6941	13.2144	14.5678
Total of Dissolved Metals Concentrations		15.68	12.394	14.3	15.91196	7.269	9.5912	14.1211	20.8917	17.46228	16.18687	12.57276	9.351
Inorganics mg/L													
Nitrate	10 (NR)	**26**	**23**	**23**	**23**	**19**	**23**	**28**	**29**	**37**	**26**	**31**	**30**
Sulfate	250 (NR)	**530**	**480**	**680**	**750**	**560**	**620**	**620**	**810**	**480**	**600**	**500**	**430**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00021**	<0.0001	**0.00026**	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.000078**	**0.000075**	**0.000089**	**0.000059**	**0.000086**	**0.00019**	**0.00020**	**0.00012**	**0.00011**	**0.000053**	**0.00011**	**0.00021**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00060**	**0.00068**	**0.00097**	**0.00081**	**0.0011**	**0.00082**	**0.001**	**0.001**	**0.00066**	**0.00049**	**0.00051**	**0.00042**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	**0.000089**	<0.00005	**0.000064**	**0.00024**	**0.00017**	**0.000063**	**0.000083**	<0.00005	<0.00005	**0.00026**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00011**	**0.000096**	**0.00013**	**0.000077**	**0.00011**	**0.00024**	**0.00027**	**0.00013**	**0.00011**	**0.00007**	**0.000098**	**0.00023**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.00079	0.00085	0.00128	0.00095	0.00136	0.00149	0.00137	0.00172	0.00096	0.00087	0.00072	0.00112
pH (std units)		4.01	4.05	3.92	4.02	3.88	4.23	4.78	3.92	4.13	4.12	4.36	5.35
Specific Conductance (mS/cm)		1.0	0.815	1.39	1.26	0.803	1.43	1.2	1.61	1.36	1.51	1.54	1.31
Turbidity (NTUs)		1.8	28.7	8.3	2.5	9.2	7.9	9.7	10.3	17.5	43	10.1	7.76
DO (mg/L)		1.0	0.02	1.2	1.2	0.0	0.88	0.2	2.02	3.84	0.69	1.73	
ORP (mV)		377	423	369	342	426	2.37	360	389	191	363	348	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**	**TW-6**
Sample Date	*Concentrations*	**5/16/2018**	**11/6/2017**	**5/5/2017**	**11/11/2016**	**6/6/2016**	**11/16/2015**	**6/1/2015**	**11/14/2014**	**5/21/2014**	**11/18/2013**	**05/29/2013**	**05/30/2012**
Metals mg/L													
Total Arsenic	0.01	**0.00672**	<0.005	<0.005	<0.005	<0.005	**0.00587**	**0.00731**	<0.005	<0.005	<0.005	**0.00821**	<0.005
Total Copper	1.3	**1.06**	**0.123**	**0.544**	**0.0917**	**0.0811**	**0.643**	**1.08**	**0.0656**	**0.380**	**0.111**	**0.917**	**0.195**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00158**	**0.00115**	<0.001
Total Zinc	2	**36.0**	**0.604**	**25.7**	**0.316**	**0.587**	**35.7**	**125.0**	**0.375**	**14.9**	**0.55**	**40.6**	**0.790**
Dissolved Arsenic	0.01	**0.00707**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00612**	<0.005	<0.005	<0.005	**0.00799**	<0.005
Dissolved Copper	1.3	**0.669**	**0.0840**	**0.404**	**0.0786**	**0.0751**	**0.556**	**0.941**	**0.079**	**0.401**	**0.0907**	**0.987**	**0.163**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**37.6**	**0.550**	**23.3**	**0.307**	**0.581**	**29.3**	**37.3**	**0.456**	**15.6**	**0.460**	**40.90**	**0.788**
Total of Total Metals Concentrations		37.06672	0.727	26.244	0.4077	0.6681	36.34887	126.08731	0.4406	15.28	0.66258	41.52636	0.9853
Total of Dissolved Metals Concentrations		38.27607	0.634	23.704	0.3856	0.6561	29.856	38.24712	0.535	16.001	0.5507	41.89499	0.9504
Inorganics mg/L													
Nitrate	10 (NR)	**34**	**34**	**36**	**30**	**14**	**19**	**28**	**8.5**	**27**	**17**	**25**	**74**
Sulfate	250 (NR)	**790**	**260**	**720**	**210**	**240**	**1900**	**670**	**230**	**460**	**260**	**960**	**440**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0018**	**0.000088**	**0.0027**	<0.00005	<0.00005	**0.0021**	**0.0018**	<0.00005	**0.00059**	<0.00005	**0.0029**	**0.00013**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0021**	**0.00074**	**0.0019**	**0.00088**	**0.0011**	**0.0015**	**0.0019**	**0.0013**	**0.00012**	**0.00098**	**0.0021**	**0.0011**
delta-BHC	0.00005(DL)	**0.00047**	<0.00005	**0.00045**	<0.00005	<0.00005	**0.00041**	**0.00057**	<0.00005	**0.00019**	<0.00005	**0.00054**	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00067**	**0.000060**	**0.00091**	<0.00005	<0.00005	**0.00091**	**0.00087**	<0.00005	**0.00024**	<0.00005	**0.0012**	**0.000066**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.00504	0.00089	0.00596	0.00088	0.00110	0.00492	0.00514	0.00130	0.00114	0.00098	0.00674	0.00126
pH (std units)		4.52	4.70	4.65	4.48	4.42	5.13	5.12	4.09	4.6	4.22	4.83	4.51
Specific Conductance (mS/cm)		1.73	0.659	1.7	0.96	0.586	1.89	1.68	0.986	1.32	1.08	2.27	2.04
Turbidity (NTUs)		0	0.0	9.7	0.0	0.0	0.2	0.3	10.7	8.3	9.56	0	3.58
DO (mg/L)		4.01	0.13	0.78	1.3	0.0	1.06	0.2	2.53	3.63	3.06	1.87	
ORP (mV)		292	181	294	328	405	228	299	370	173	3.77	301	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**	**TW-7**
Sample Date	*Concentrations*	**5/16/2018**	**11/7/2017**	**5/9/2017**	**11/11/2016**	**6/6/2016**	**11/17/2015**	**6/5/2015**	**11/18/2014**	**5/22/2014**	**11/19/2013**	**05/28/2013**	**06/01/2012**
Metals mg/L													
Total Arsenic	0.01	**0.0108**	<0.005	<0.005	<0.005	<0.005	**0.0317**	<0.005	**0.0152**	**0.0126**	**0.0136**	**0.0139**	<0.05
Total Copper	1.3	**124**	**197**	**215**	**132**	**142**	**131**	**134**	**124**	**153**	**256**	**170**	**95.0**
Total Lead	0.015	**0.019**	**0.0398**	**0.0503**	**0.0264**	**0.0238**	**0.0212**	**0.0364**	**0.0286**	<0.001	**0.0941**	**0.0117**	**0.0391**
Total Zinc	2	**359**	**378**	**398**	**327**	**314**	**260**	**286**	**204**	**322**	**515**	**310**	**226**
Dissolved Arsenic	0.01	**0.0113**	<0.100	<0.250	<0.005	<0.005	**0.0399**	<0.005	**0.0147**	**0.011**	<0.005	**0.0127**	<0.100
Dissolved Copper	1.3	**128**	**185**	**208**	**140**	**89.8**	**122**	**174**	**99.2**	**125**	**191**	**175**	**88.4**
Dissolved Lead	0.015	**0.0187**	**0.0222**	**0.0404**	**0.0326**	**0.019**	**0.0231**	**0.0342**	**0.0275**	**0.0353**	**0.0750**	**0.00829**	**0.0404**
Dissolved Zinc	2	**381**	**350**	**377**	**311**	**173**	**254**	**347**	**228**	**258**	**370**	**323**	**237**
Total of Total Metals Concentrations		483.0298	575.0398	613.0503	459.0264	456.0238	391.0529	420.0364	328.0438	475.0126	771.1077	480.0256	320.68909
Total of Dissolved Metals Concentrations		509.03	535.0222	585.0404	451.0326	262.819	376.063	521.0342	327.2422	383.0463	561.075	498.02099	325.7004
Inorganics mg/L													
Nitrate	10 (NR)	**110**	**88**	**91**	**110**	**110**	**110**	**2**	**77**	**110**	**73**	**60**	**140**
Sulfate	250 (NR)	**4400**	**3700**	**6800**	**3400**	**1800**	**3600**	**270**	**5000**	**3900**	**5700**	**5000**	**2900**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	**0.00023**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00096 JH**	**0.00060**	**0.00048**	**0.00029**	**0.00042**	**0.00054**	**0.00039**	**0.00045**	**0.00031**	**0.00040**	**0.00021**	**0.00029**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0027 JH**	**0.0022**	**0.0015**	**0.0019**	**0.0024**	**0.0018**	**0.0015**	**0.0014**	**0.0013**	**0.00040**	**0.00039**	**0.0013**
delta-BHC	0.00005(DL)	**0.00097 JH**	<0.0005	**0.00013**	**0.000087**	**0.00013**	**0.00014**	**0.000086**	**0.00011**	**0.000058**	<0.000050	**0.000074**	**0.00017**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00099 JH**	**0.00043**	**0.00036**	**0.00027**	**0.00037**	**0.00035**	**0.00028**	**0.00032**	**0.00025**	**0.00018**	**0.00015**	**0.00029**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.00562	0.00346	0.00247	0.00255	0.00332	0.00283	0.00226	0.00228	0.00192	0.00098	0.00082	0.00201
pH (std units)		3.67	3.85	3.66	4.09	4.1	3.8	3.64	3.88	3.72	3.39	3.73	4.02
Specific Conductance (mS/cm)		5.22	5.8	6.84	4.52	4.48	5.41	5.3	5.73	5.2	8.14	5.62	6.15
Turbidity (NTUs)		9.84	7.3	82.6	10	222	2.9	15.7	8.38	0	9.80	16.8	3.48
DO (mg/L)		1.49	0.06	0.9	0.8	0.0	1.5	0	5.45	2.53	2.20	1.87	
ORP (mV)		243	141	295	225	257	249	230	275	315	286	309	

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**	**TW-8**
Sample Date	*Concentrations*	**5/16/2018**	**11/6/2017**	**5/8/2017**	**11/14/2016**	**6/6/2016**	**11/13/2015**	**6/2/2015**	**11/14/2014**	**5/19/2014**	**1/8/2014**	**10/9/2013**	**7/16/2013**
Metals mg/L													
Total Arsenic	0.01	**0.0988**	**0.163**	**0.0938**	**0.108**	**0.102**	**0.0878**	**0.0979**	**0.121**	**0.104**	**0.128**	**0.101**	**0.135**
Total Copper	1.3	**0.0664**	**0.0262**	**0.0216**	**0.0233**	**0.055**	**0.0135**	**0.0199**	**0.0106**	**0.00847**	**0.013**	**0.0110**	**0.0085**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00127**	**0.00237**	<0.001	<0.001	**0.00134**	**0.00211**	<0.001
Total Zinc	2	**1.14**	**2.92**	**1.44**	**4.79**	**2.09**	**1.68**	**2.02**	**3.59**	**2.54**	**2.60**	**1.52**	**1.72**
Dissolved Arsenic	0.01	**0.0248**	**0.0727**	**0.0104**	**0.0784**	**0.0846**	**0.0541**	**0.0369**	**0.0146**	**0.0738**	**0.121**	**0.0831**	**0.0857**
Dissolved Copper	1.3	**0.02030**	**0.00561**	**0.00347**	**0.0178**	**0.0082**	**0.00271**	**0.00244**	**0.0035**	<0.002	<0.002	<0.002	<0.002
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.544**	**2.21**	**0.208**	**4.23**	**1.75**	**1.31**	**1.37**	**2.98**	**2.07**	**1.47**	**1.12**	**1.08**
Total of Total Metals Concentrations		1.3052	3.1092	1.5554	4.9213	2.247	1.783	2.140	3.722	2.652	2.742	1.634	1.863
Total of Dissolved Metals Concentrations		0.5891	2.28831	0.22187	4.3262	1.8428	1.3668	1.4093	2.9981	2.1438	1.5910	1.2031	1.1657
Inorganics mg/L													
Nitrate	10 (NR)	<0.25	<0.25	<0.25	<2.5	<2.5	<2.5	<2.5	<12	<0.25	<2.5	<12	<12
Sulfate	250 (NR)	**850**	**620**	**930**	**670**	**720**	**890**	**650**	**630**	**600**	**980**	**890**	**990**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	**0.0036**	<0.010	**0.0042**	<0.002	**0.0018**	**0.0046**	**0.0039**	**0.019**	<0.0001	**0.007**	**0.0057**	**0.0051**
4,4´-DDE	0.0001	<0.00010	<0.00010	<0.0001	<0.002	<0.0001	<0.0001	<0.0001	<0.01	<0.0001	**0.0013**	**0.00049**	<0.001
4,4´-DDT	0.0001	**0.013 J**	<0.010	**0.0086**	<0.002	**0.0015**	**0.0036**	**0.015**	**0.350**	<0.0001	**0.15**	**0.0500**	**0.0085**
alpha-BHC	0.00005(DL)	**0.74**	**0.36**	**0.65**	**0.26**	**0.59**	**0.58**	**0.45**	**0.340**	**0.007**	**0.760**	**0.310**	**0.740**
alpha-Chlordane	0.002	<0.00005	**0.00028**	<0.00005	<0.001	<0.00005	**0.00021**	<0.00005	<0.005	<0.00005	**0.00031**	**0.00015**	<0.0005
beta-BHC	0.00005(DL)	**0.078**	**0.0450**	**0.075**	**0.034**	**0.067**	**0.087**	**0.054**	**0.140**	**0.0022**	**0.22**	**0.092**	**0.11**
delta-BHC	0.00005(DL)	**2.0**	**0.11**	**2**	**0.076**	**0.74**	**1.2**	**1.2**	**0.160**	**0.008**	**2.40**	**2.40**	**2.20**
Dieldrin	0.0001(DL)	**0.0040**	**0.0029**	**0.0031**	<0.002	**0.0014**	**0.0041**	**0.0036**	<0.01	<0.0001	**0.0074**	**0.0074**	**0.0062**
gamma-BHC	0.0002	**1.70**	**0.15**	**1.5**	**0.086**	**0.72**	**1.0**	**0.97**	**0.230**	**0.0034**	**2.0**	**1.2**	**1.8**
gamma-Chlordane	0.002	**0.00079**	**0.00085**	**0.00068**	<0.001	**0.00034**	**0.00096**	**0.001**	<0.005	<0.00005	**0.0018**	**0.0011**	**0.0011**
Heptachlor	0.0004	<0.00005	<0.00005	<0.005	<0.001	**0.013**	<0.00005	<0.00005	<0.005	<0.00005	<0.00005	<0.0005	<0.0005
Methoxychlor	0.04	<0.005	<0.005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.5	<0.005	<0.005	<0.005	<0.005
Total Pesticides		4.53939	0.66903	4.24158	0.45600	2.13504	2.88047	2.69750	1.23900	0.02060	5.54781	4.06684	4.871
pH (std units)		6.18	6.3	6.84	5.99	6.55	6.35	4.32	5.81	6.18	6.35	6.19	6.34
Specific Conductance (mS/cm)		2.35	2.03	3.29	1.45	1.33	2.76	1.97	1.97	1.76	2.503	2.893	2.689
Turbidity (NTUs)		0	3.4	0.9	0.0	0.0	0.7	0	67.0	0	4.05	14.5	1.2
DO (mg/L)		0.87	0.3	1.03	1.2	0.0	0.84	0.17	2.35	2.4	1.35	1.57	0.58
ORP (mV)		-101	-59	-92	91	-70	-65	66	-41	20	-109.6	-87.5	-87.4

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-8**	**TW-8**	**TW-8**	**TW-9**	**TW-9**	**TW-9**	**TW-9**	**TW-9**	**TW-9**	**TW-9**	**TW-9**	**TW-9**
Sample Date	*Concentrations*	**4/15/2013**	**1/21/2013**	**05/31/2012**	**5/16/2018**	**11/6/2017**	**5/8/2017**	**11/14/2016**	**6/7/2016**	**11/17/2015**	**6/8/2015**	**11/17/2014**	**5/22/2014**
Metals mg/L													
Total Arsenic	0.01	**0.164**	**0.155**	**0.101**	<0.005	<0.005	<0.005	**0.02370**	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0903**	**0.0159**	**0.0668**	**0.0534**	**0.1220**	**0.0836**	**0.191**	**0.158**	**0.0998**	**0.105**	**0.110**	**0.0599**
Total Lead	0.015	<0.001	**0.0088**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**4.05**	**3.27**	**4.43**	**2.28**	**3.79**	**3.38**	**4.04**	**3.48**	**3.6**	**7.89**	**4.51**	**3.09**
Dissolved Arsenic	0.01	**0.0457**	**0.156**	**0.0174**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.0234**	<0.002	**0.0278**	**0.0402**	**0.101**	**0.0767**	**0.182**	**0.128**	**0.0841**	**0.0964**	**0.0921**	**0.04850**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**3.04**	**2.84**	**4.16**	**1.92**	**3.50**	**0.999**	**4.01**	**3.47**	**3.79**	**4.84**	**4.54**	**3.01**
Total of Total Metals Concentrations		4.3043	**3.450**	4.59973	2.3334	3.912	3.4636	4.2547	3.63800	3.700	7.995	4.620	3.150
Total of Dissolved Metals Concentrations		3.1091	**2.996**	4.20515	1.9602	3.601	1.0757	4.192	3.598	3.8741	4.9364	4.6321	3.0585
Inorganics mg/L													
Nitrate	10 (NR)	<2.5	<2.5	<2.5	**0.27**	**0.39**	**0.54**	<2.5	<2.5	**3.1**	<0.25	<0.25	<2.5
Sulfate	250 (NR)	**1100**	**390**	**750**	**160**	**260**	**290**	**230**	**240**	**450**	**610**	**340**	**250**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	**0.0019**	<1.0	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.1	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	**0.0013**	**3.2**	<0.01	**0.0002**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.410**	**10.0**	**0.64**	**0.0048**	**0.014**	**0.012**	**0.0067**	**0.0077**	**0.017**	**0.0085**	**0.0088**	**0.014**
alpha-Chlordane	0.002	<0.0025	<0.050	<0.005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.05**	**1.50**	**0.11**	**0.0090**	**0.0062**	**0.004**	**0.003**	**0.0045**	**0.012**	**0.0059**	**0.0044**	**0.0014**
delta-BHC	0.00005(DL)	**1.30**	**9.3**	**1.6**	**0.0035**	**0.0071**	**0.0075**	**0.0037**	**0.0049**	**0.0088**	**0.0065**	**0.0077**	**0.0066**
Dieldrin	0.0001(DL)	**0.0027**	<0.1	<0.01	**0.00019**	**0.00017**	**0.00013**	<0.0001	<0.0001	**0.00016**	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**1.2**	**6.2**	**1.3**	**0.0015**	**0.0011**	**0.004**	**0.00088**	**0.00077**	**0.0015**	**0.0017**	**0.0011**	**0.00035**
gamma-Chlordane	0.002	<0.0025	<0.05	<0.005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.0025	**0.260**	**0.041**	**0.00017**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.50	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<5.0	<0.5	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005
Total Pesticides		2.966	30.46	3.6385	0.01936	0.02857	0.02763	0.01428	0.01787	0.039460	0.022600	0.022000	0.0224
pH (std units)		6.36	5.90	6.18	5.47	5.65	5.66	5.6	5.58	5.34	1.93	5.26	5.53
Specific Conductance (mS/cm)		2.749	1.117	1.91	0.436	0.435	0.686	0.573	0.434	0.91	0.835	0.918	0.637
Turbidity (NTUs)		4.8	328	2.01	0	9.8	0	0.0	0.0	1.7	0.5	2.21	1.66
DO (mg/L)		0.79	1.63		0.7	0.13	0.79	1.0	0.0	0.96	1.53	2.12	0.7
ORP (mV)		-41.2	-9.7		134	186	175	124	210	180	469	231	199

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-9**	**TW-9**	**TW-9**	**TW-10**	**TW-10**	**TW-10**	**TW-10**	**TW-10**	**TW-10**	**TW-10**	**TW-10**	**TW-10**
Sample Date	*Concentrations*	**11/18/2013**	**05/28/2013**	**05/31/2012**	**5/17/2018**	**11/7/2017**	**5/9/2017**	**11/14/2016**	**6/7/2016**	**11/17/2015**	**6/8/2015**	**11/17/2014**	**5/22/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00521**	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0701**	**0.0407**	**0.0168**	**9.45**	**9.88**	**10.3**	**20**	**7.6**	**12.6**	**14.2**	**16.90**	**17.10**
Total Lead	0.015	**0.00161**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0143**
Total Zinc	2	**2.42**	**2.20**	**1.26**	**10.8**	**11.4**	**11.5**	**20**	**18.6**	**11.2**	**16.80**	**18.20**	**21.9**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	**0.00604**	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.00950**	**0.0343**	**0.0158**	**10.4**	**8.62**	**9.97**	**10.3**	**7.57**	**14.5**	**19.2**	**19.2**	**15.4**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**2.26**	**1.92**	**1.18**	**11.6**	**11.3**	**11**	**17.9**	**15.7**	**12.9**	**22.20**	**21.2**	**18.9**
Total of Total Metals Concentrations		2.492	2.2407	1.27475	20.25	21.28	21.8	40	26.2	23.80521	31	35.1	39.0143
Total of Dissolved Metals Concentrations		2.2695	1.9543	1.19178	22.00	19.92	20.97	28.2	23.27	27.4	41.4	40.40	34.30000
Inorganics mg/L													
Nitrate	10 (NR)	<1.2	<1.2	**0.49**	**1.9**	**2.2**	**1.8**	<2.5	<2.5	<5	**2.50**	**1.8**	<2.5
Sulfate	250 (NR)	**170**	**170**	**170**	**650**	**410**	**580**	**830**	**830**	**770**	**730**	**600**	**900**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0015**	**0.0009**	**0.0074**	<0.00005	<0.00005	<0.00005	**0.000099**	<0.00005	**0.00056**	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00056**	**0.00091**	**0.0054**	<0.00005	<0.00005	<0.00005	<0.00005	**0.000092**	**0.00042**	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	**0.00073**	**0.00048**	**0.0043**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00029**	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	**0.00041**	<0.00010	**0.00010**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.000094**	**0.000069**	**0.0011**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000058**	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.0033	0.00236	0.01826	BDL	BDL	BDL	0.000099	0.000092	0.00133	BDL	BDL	BDL
pH (std units)		5.33	5.4	5.78	3.53	3.75	3.96	3.77	3.51	3.6	1.93	3.46	3.67
Specific Conductance (mS/cm)		0.565	0.878	0.61	0.818	0.501	0.904	1.12	0.798	1.154	0.835	1.27	1.12
Turbidity (NTUs)		0.0	7.83	0.47	0	0.0	5.3	0.0	0.0	3.78	0.5	9.89	3.42
DO (mg/L)		0.77	3.8		2.57	1.19	2.8	1.8	0.0	0.96	1.53	2.74	2.17
ORP (mV)		157	230		253	471	430	213	352	395.6	469	430	445

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-10**	**TW-10**	**TW-10**	**TW-11**	**TW-11**	**TW-11**	**TW-11**	**TW-11**	**TW-11**	**TW-11**	**TW-11**	**TW-11**
Sample Date	*Concentrations*	**11/18/2013**	**05/24/2013**	**05/31/2012**	**5/10/2018**	**11/1/2017**	**5/3/2017**	**11/8/2016**	**6/1/2016**	**11/11/2015**	**5/27/2015**	**11/11/2014**	**5/13/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**9.66**	**11.4**	**6.98**	**0.152**	**0.121**	**0.139**	**0.203**	**0.137**	**0.11**	**0.142**	**0.130**	**0.147**
Total Lead	0.015	**0.00161**	**0.00182**	**0.00271**	<0.001	**0.00141**	**0.00116**	**0.00159**	**0.00111**	<0.001	**0.00147**	**0.00104**	**0.00148**
Total Zinc	2	**16.2**	**13.6**	**9.24**	**0.594**	**0.477**	**2.67**	**0.847**	**0.495**	**0.386**	**0.504**	**0.514**	**0.591**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**11.5**	**10.5**	**6.43**	**0.148**	**0.114**	**0.127**	**0.180**	**0.129**	**0.117**	**0.126**	**0.135**	**0.134**
Dissolved Lead	0.015	<0.001	**0.00113**	**0.00228**	<0.001	**0.00101**	<0.001	**0.00116**	<0.001	<0.001	<0.001	<0.001	**0.00144**
Dissolved Zinc	2	**14.4**	**12.5**	**8.66**	**0.571**	**0.455**	**0.536**	**0.736**	**0.476**	**0.396**	**0.461**	**0.501**	**0.514**
Total of Total Metals Concentrations		25.86161	25.00182	16.221709	0.746	0.59941	2.81016	1.05159	0.63311	0.496	0.64747	0.64504	0.73948
Total of Dissolved Metals Concentrations		25.90000	23.00113	15.09528	0.719	0.57001	0.663	0.91716	0.605	0.513	0.587	0.636	0.64944
Inorganics mg/L													
Nitrate	10 (NR)	<2.5	**3.6**	**2.9**	**5.5**	**5.3**	**5.2**	<12	**5**	**5.7**	**5.1**	**2.8**	**4.4**
Sulfate	250 (NR)	**530**	**620**	**490**	**190**	**150**	**150**	**280**	**170**	**160**	**160**	**150**	**170**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	**0.000091**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.004**	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.0049**	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	**0.00023**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.0034**	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00012**	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	**0.00012**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.0011**	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	0.00045	BDL	BDL	BDL	BDL	BDL	0.01352	BDL	BDL	BDL
pH (std units)		3.69	3.87	4.1	4.19	4.30	4.22	4.31	3.89	4.36	4.4	4.10	4.24
Specific Conductance (mS/cm)		1.06	1.28	0.92	0.369	0.281	0.411	0.613	0.494	0.481	0.345	0.519	0.476
Turbidity (NTUs)		0.00	9.57	6.43	0.93	2.2	8.56	0.0	3.3	0.6	9.71	9.53	1.9
DO (mg/L)		2.50	6.23		1.99	1.50	3.5	4.15	2.51	2.67	1.57	3.83	3.35
ORP (mV)		412	454		381	398	336	312	400	250	404	-30	232

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-11**	**TW-11**	**TW-11**	**TW-12**	**TW-12**	**TW-12**	**TW-12**	**TW-12**	**TW-12**	**TW-12**	**TW-12**	**TW-12**
Sample Date	*Concentrations*	**11/13/2013**	**05/23/2013**	**05/31/2012**	**5/9/2018**	**10/31/2017**	**5/2/2017**	**11/8/2016**	**6/1/2016**	**11/10/2015**	**5/27/2015**	**11/11/2014**	**5/13/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.146**	**0.145**	**0.132**	<0.01	<0.002	**0.00737**	**0.00448**	**0.0171**	**0.00305**	**0.00831**	**0.0041**	**0.00258**
Total Lead	0.015	**0.00195**	**0.00233**	**0.00252**	<0.001	<0.001	**0.00923**	<0.001	**0.00140**	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**0.513**	**0.566**	**0.738**	**0.167**	**0.148**	**0.242**	**0.212**	**0.0809**	**0.197**	**0.214**	**0.204**	**0.134**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.144**	**0.126**	**0.121**	<0.002	<0.002	<0.002	**0.00297**	**0.00901**	<0.002	**0.00927**	<0.002	<0.002
Dissolved Lead	0.015	**0.00154**	**0.00209**	**0.00212**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.47**	**0.495**	**0.688**	**0.164**	**0.143**	**0.0843**	**0.186**	**0.0665**	**0.197**	**0.207**	**0.191**	**0.178**
Total of Total Metals Concentrations		0.66095	0.71333	0.872222	0.167	0.148	0.2586	0.21648	0.0994	0.20005	0.22231	0.2081	0.13658
Total of Dissolved Metals Concentrations		0.61554	0.62309	0.811023	0.164	0.143	0.0843	0.18897	0.07551	0.197	0.21627	0.191	0.178
Inorganics mg/L													
Nitrate	10 (NR)	**3.7**	**3.5**	**3.7**	**1.7**	**2.0**	**2**	**1.5**	<0.25	**2.6**	**2.2**	<1.2	**1.7**
Sulfate	250 (NR)	**180**	**160**	**170**	**58**	**68**	**61**	**70**	<5	**65**	**72**	**60**	**69**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	**0.000092**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	BDL	BDL	0.000092	BDL	BDL	BDL	BDL	BDL	BDL	BDL
pH (std units)		4.27	4.37	4.78	6.13	5.76	5.61	5.22	4.59	5.18	4.86	4.5	4.83
Specific Conductance (mS/cm)		0.464	0.7	0.51	0.191	0.140	0.228	0.222	0.224	0.313	0.203	0.292	0.215
Turbidity (NTUs)		6.16	9.81	0.81	15.9	103	875	5.7	8.9	2.4	2.7	4.1	3.6
DO (mg/L)		3.6	3.48		1.32	2.54	2.73	4.7	2.19	3.61	2.47	6.48	6.43
ORP (mV)		357	350		29	152	224	261	318	246	361	266	334

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**TW-12**	**TW-12**	**TW-12**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**
Sample Date	*Concentrations*	**11/12/2013**	**05/23/2013**	**05/31/2012**	**5/8/2018**	**10/31/2017**	**5/2/2017**	**11/8/2016**	**6/1/2016**	**11/10/2015**	**5/27/2015**	**11/11/2014**	**5/13/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	<0.002	<0.002	**0.00291**	<0.01	<0.002	<0.002	**0.00323**	**0.00655**	**0.00226**	**0.00838**	**0.00585**	**0.0209**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	**0.00491**
Total Zinc	2	**0.182**	**0.263**	**0.0715**	**0.0146 JB**	<0.0100	<0.0100	**0.0206**	**0.0471**	**0.01**	**0.0310**	**0.019**	**0.0876**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	<0.002	<0.002	<0.002	**0.00414**	<0.002	<0.002	<0.002	**0.00299**	<0.002	**0.00413**	**0.00305**	<0.002
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.195**	**0.231**	**0.0529**	**0.0157**	<0.01	<0.01	<0.01	**0.0274**	<0.01	**0.0238**	**0.0174**	**0.0349**
Total of Total Metals Concentrations		0.182	0.263	0.074373	0.0146	BDL	BDL	0.02383	0.05365	0.01226	0.03938	0.02485	0.11341
Total of Dissolved Metals Concentrations		0.195	0.231	0.05291	0.01984	BDL	BDL	BDL	0.03039	BDL	0.02793	0.02045	0.0349
Inorganics mg/L													
Nitrate	10 (NR)	**3.0**	**3.2**	**2.7**	**6.8**	**6.8**	**4.6**	**5.9**	**5**	**5.4**	**4.9**	**6.2**	**3.5**
Sulfate	250 (NR)	**75**	**68**	**67**	**28**	**28**	**28**	**38**	**31**	**37**	**33**	**37**	**38**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
pH (std units)		5.19	5.47	6.15	6.18	6.16	6.32	5.48	5.94	7.05	6.44	5.14	5.81
Specific Conductance (mS/cm)		0.238	0.493	0.36	0.305	0.317	0.326	0.457	0.343	0.403	0.338	0.474	0.401
Turbidity (NTUs)		9.89	8.7	15.2	0	0	0	1.1	8.4	1	0.5	0.0	2.3
DO (mg/L)		4.41	5.2		4.51	1.35	3.68	1.59	1.36	23.9	3.57	2.10	5.73
ORP (mV)		165	220		148	194	153	221	219	176	67	205	197

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-1B**	**MW-1B**	**MW-1B**	**MW-1B**	**MW-22**	**MW-22**	**MW-22**	**MW-22**	**MW-22**	**MW-22**	**MW-22**	**MW-22**
Sample Date	*Concentrations*	**11/12/2013**	**05/21/2013**	**11/13/2012**	**7/29/2010 & 9/13/2010**	**5/15/2018**	**11/1/2017**	**5/4/2017**	**11/8/2016**	**6/6/2016**	**11/12/2015**	**5/29/2015**	**11/12/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0167**	**0.0124**	**0.0232**	<0.005	**1.44**	**3.66**	**2.8**	**1.64**	**1.61**	**1.58**	**1.56**	**2.30**
Total Lead	0.015	**0.00408**	**0.00348**	**0.00113**	<0.0015	**0.00209**	**0.00308**	**0.00424**	**0.00413**	**0.00375**	**0.0032**	**0.00235**	**0.00306**
Total Zinc	2	**0.0403**	**0.0547**	**0.0679**	<0.02	**4.53**	**7.25**	**6.47**	**3.13**	**2.91**	**2.81**	**4.15**	**4.290**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	na	<0.005	<0.050	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.00266**	<0.002	**0.0258**	na	**1.55**	**3.34**	**2.56**	**1.51**	**1.46**	**1.81**	**1.46**	**2.16**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	na	**0.00214**	**0.00281**	**0.00371**	**0.00349**	**0.00308**	**0.00273**	**0.0019**	**0.00342**
Dissolved Zinc	2	<0.01	<0.01	**0.0767**	na	**5.00**	**6.59**	**3.1**	**3.04**	**2.68**	**2.96**	**3.92**	**3.74**
Total of Total Metals Concentrations		0.06108	0.07058	0.09223	BDL	5.97209	10.91308	9.27424	4.77413	4.52375	4.3932	5.71235	6.59306
Total of Dissolved Metals Concentrations		0.00266	BDL	0.1025		6.55214	9.93281	5.66371	4.55349	4.14308	4.77273	5.3819	5.90342
Inorganics mg/L													
Nitrate	10 (NR)	**7.0**	**3.0**	**3.6**	**4.5**	**3.2**	**2.1**	**2.9**	<12	<2.5	**2.8**	**2.1**	**1.7**
Sulfate	250 (NR)	**34**	**35**	**32**	**35**	**450**	**450**	**640**	**430**	**420**	**360**	**390**	**310**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.000048	**0.00012**	**0.00011**	**0.00014**	**0.00028**	**0.00031**	**0.00017**	**0.00014**	**0.00019**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.000048	**0.00052**	**0.00028**	**0.00045**	**0.00039**	**0.0004**	**0.00041**	**0.00055**	**0.00054**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.000048	**0.000072**	<0.00005	<0.00005	**0.000075**	**0.00011**	**0.000052**	**0.000057**	**0.000091**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.000048	**0.00018**	**0.00014**	**0.00013**	**0.00025**	**0.00027**	**0.00016**	**0.00013**	**0.00016**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	BDL	BDL	0.00089	0.00053	0.00072	0.00100	0.00109	0.00079	0.00088	0.00098
pH (std units)		6.13	6.16	6.25	5.92/5.17	4.32	3.95	4.1	3.99	3.59	4.21	4.34	3.81
Specific Conductance (mS/cm)		0.418	0.57	0.983	0.36/0.35	0.688	0.691	0.865	0.820	0.737	0.603	0.606	0.760
Turbidity (NTUs)		0.99	8.03	6.35	6.4/2.76	0	0	0	4.9	7.6	2.2	0	2.2
DO (mg/L)		4.35	4.78	3.5		0.92	0.14	1.17	1.55	1.23	29.2	0	2.1
ORP (mV)		202	137	163		224	384	250	409	364	320	312	437

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-22**	**MW-22**	**MW-22**	**MW-22**	**MW-22**	**MW-25**	**MW-25**	**MW-25**	**MW-25**	**MW-25**	**MW-25**	**MW-25**
Sample Date	*Concentrations*	**5/19/2014**	**11/13/2013**	**5/22/2013**	**11/14/2012**	**7/28/2010 & 9/13/2010**	**5/17/2018**	**11/8/2017**	**5/10/2017**	**11/10/2016**	**6/7/2016**	**11/13/2015**	**6/2/2015**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	**0.0038**	<0.005	Well was	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**2.23**	**2.93**	**0.354**	**2.01**	**4.0**	**0.396**	dry and	**0.238**	**0.266**	**0.318**	**0.28**	**0.269**
Total Lead	0.015	**0.00518**	**0.00446**	<0.001	**0.00553**	**0.004**	**0.0146**	was not	**0.0328**	**0.0326**	**0.0176**	**0.0233**	**0.0153**
Total Zinc	2	**3.73**	**4.90**	**1.48**	**4.23**	**8.3**	**4.42**	sampled	**3.15**	**3.18**	**2.96**	**2.83**	**3.31**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	na	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**2.02**	**1.90**	**0.308**	**1.68**	na	**0.378**		**0.237**	**0.217**	**0.312**	**0.276**	**0.291**
Dissolved Lead	0.015	**0.00294**	**0.00446**	<0.001	**0.0049**	na	**0.014**		**0.0321**	**0.0324**	**0.0161**	**0.0225**	**0.0138**
Dissolved Zinc	2	**4.33**	**3.05**	**1.44**	**2.97**	na	**4.73**		**1.03**	**3**	**2.92**	**2.67**	**3.5**
Total of Total Metals Concentrations		5.96518	7.83446	1.834	6.24553	12.3078	4.8306		3.4208	3.4786	3.2956	3.1333	3.5943
Total of Dissolved Metals Concentrations		6.35294	4.95446	1.748	4.6549		5.122		1.2991	3.2494	3.2481	2.9685	3.8048
Inorganics mg/L													
Nitrate	10 (NR)	**1.6**	<2.5	**3.7**	<2.5	**1.5**	**4.5**		**1.7**	**1.5**	<2.5	**2.1**	**1.2**
Sulfate	250 (NR)	**400**	**380**	**470**	**380**	**750**	**330**		**260**	**270**	**260**	**270**	**260**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00027**	**0.00019**	**0.00018**	**0.00022**	**0.00079**	**0.000082**		**0.00012**	<0.00005	**0.00014**	**0.00016**	**0.00014**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00049	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00079**	**0.00043**	**0.001**	**0.00052**	**0.00096**	**0.0034**		**0.0056**	**0.0047**	**0.0054**	**0.0049**	**0.0035**
delta-BHC	0.00005(DL)	**0.00013**	<0.00005	**0.00016**	**0.00013**	**0.00026**	**0.00011**		**0.00014**	**0.000099**	**0.00013**	**0.00019**	**0.00011**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00023**	**0.00016**	**0.00015**	**0.00021**	**0.00047**	<0.00005		**0.000056**	<0.00005	**0.000054**	**0.000066**	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.000097	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.0049	<0.003		<0.003	<0.003	<0.003	<0.005	<0.005
Total Pesticides		0.00142	0.00078	0.00149	0.00108	0.00248	0.00359		0.00592	0.00480	0.00572	0.00532	0.00375
pH (std units)		4.52	4.12	5.77	3.98	3.97/4.01	4.05		4.91	4.64	4.05	4.42	4.18
Specific Conductance (mS/cm)		0.806	0.662	1.03	0.682	0.76/1.03	0.541		0.582	0.558	0.373	0.659	0.439
Turbidity (NTUs)		10.7	1.23	0.27	0.9	6.8/1.98	0		0.4	0.0	0.0	1.5	8.7
DO (mg/L)		1.85	0.71	1.25	1.09		2.17		2.02	2.4	0.0	2.12	0.98
ORP (mV)		2.86	241	167	319		290		294	206	328	307	375

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-25**	**MW-25**	**MW-25**	**MW-25**	**MW-25**	**MW-25**	**MW-26**	**MW-26**	**MW-26**	**MW-26**	**MW-26**	**MW-26**
Sample Date	*Concentrations*	**11/18/2014**	**5/1/2014**	**11/18/2013**	**5/24/2013**	**2012**	**9/14/2010**	**5/10/2018**	**11/1/2017**	**5/3/2017**	**11/9/2016**	**6/2/2016**	**11/11/2015**
Metals mg/L													
Total Arsenic	0.01	<0.005	Well could	Well was	**0.0327**	Well was	**0.0027**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.204**	not be located	dry and	**0.363**	dry and	**0.32**	**0.0084 JB**	**0.00855**	**0.00809**	**0.0117**	**0.00841**	**0.011**
Total Lead	0.015	**0.025**	and was not	was not	**0.314**	was not	**0.02**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00109**
Total Zinc	2	**2.88**	sampled	sampled	**3.26**	sampled	**2.9**	**0.156**	**0.175**	**0.126**	**0.155**	**0.138**	**0.14**
Dissolved Arsenic	0.01	<0.005			<0.005		na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.195**			**0.317**		na	<0.005	**0.00848**	**0.00753**	**0.0103**	**0.00752**	**0.00754**
Dissolved Lead	0.015	**0.0181**			**0.0283**		na	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**2.86**			**3.43**		na	**0.142**	**0.172**	**0.116**	**0.124**	**0.105**	**0.126**
Total of Total Metals Concentrations		3.109			3.9697		3.2427	**0.1644**	0.18355	0.13409	0.1667	0.14641	0.1521
Total of Dissolved Metals Concentrations		3.0731			3.7753			0.142	0.18048	0.12353	0.1343	0.11252	0.13354
Inorganics mg/L													
Nitrate	10 (NR)	**0.33**			**1.9**		**4.7**	**3.6**	**3.1**	**3.2**	**3**	**3.5**	**1.4**
Sulfate	250 (NR)	**190**			**240**		**200**	**190**	**260**	**230**	**310**	**210**	**270**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001			<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001			<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001			<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00014**			**0.00026**		**0.00019**	**0.000052**	<0.00005	<0.00005	<0.00005	**0.000077**	<0.00005
alpha-Chlordane	0.002	<0.00005			<0.00005		<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0074**			**0.0021**		**0.00095**	**0.00058**	**0.00046**	**0.00031**	**0.00036**	**0.00078**	**0.00036**
delta-BHC	0.00005(DL)	**0.00010**			**0.000075**		**0.00013**	**0.000058**	**0.000056**	<0.00005	**0.000055**	**0.0001**	**0.000064**
Dieldrin	0.0001(DL)	<0.0001			<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005			**0.00008**		**0.00012**	<0.00005	<0.00005	<0.00005	<0.00005	**0.000052**	**0.021**
gamma-Chlordane	0.002	<0.00005			<0.00005		na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005			<0.00005		<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005			<0.0005		<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005			<0.005		<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005
Total Pesticides		0.00764			0.002515		0.00139	0.00069	0.00052	0.00031	0.00042	0.00101	0.021424
pH (std units)		4.49	DRY	DRY	4.46	DRY	4.07	4.56	4.92	4.95	4.99	4.47	5.11
Specific Conductance (mS/cm)		0.578			0.776		0.49	0.383	0.527	0.553	0.642	0.528	0.583
Turbidity (NTUs)		0.0			354		9.7	1.36	1.3	0	1.6	2.6	6.3
DO (mg/L)		4.51			7.99			1.11	0	0.96	0.0	0.55	1.88
ORP (mV)		150			282			259	320	216	311	336	300

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-26**	**MW-26**	**MW-26**	**MW-26**	**MW-26**	**MW-26**	**MW-26**	**MW-101**	**MW-101**	**MW-101**	**MW-101**	**MW-101**
Sample Date	*Concentrations*	**5/28/2015**	**11/12/2014**	**5/14/2014**	**11/13/2013**	**5/22/2013**	**11/14/2012**	**7/28/2010 & 9/13/2010**	**5/9/2018**	**11/1/2017**	**5/2/2017**	**11/8/2016**	**6/1/2016**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0102**	**0.0126**	**0.0193**	**0.144**	**0.0146**	**0.0204**	**0.01**	**0.0357**	**0.00503**	**0.00609**	**0.00963**	**0.0113**
Total Lead	0.015	<0.001	**0.00139**	**0.00247**	**0.00122**	**0.00136**	**0.00799**	<0.0015	**0.00539**	**0.00173**	**0.00186**	**0.00163**	**0.00332**
Total Zinc	2	**0.142**	**0.168**	**0.166**	**0.164**	**0.209**	**0.228**	**0.16**	**2.35**	**1.50**	**2.03**	**0.194**	**0.751**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.0097**	**0.0109**	**0.0137**	**0.00811**	**0.00873**	**0.00814**	na	**0.0164 JB**	**0.00475**	**0.00561**	**0.0075**	**0.00863**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	**0.00100**	<0.001	<0.001	na	**0.00193**	**0.00164**	**0.00181**	**0.00112**	**0.00175**
Dissolved Zinc	2	**0.136**	**0.179**	**0.149**	**0.16**	**0.175**	**0.219**	na	**2.19**	**1.43**	**2.03**	**0.174**	**0.741**
Total of Total Metals Concentrations		0.1522	0.18199	0.18777	0.30922	0.22496	0.25639	0.17	2.39109	1.50676	2.03795	0.20526	0.76562
Total of Dissolved Metals Concentrations		0.1457	0.1899	0.1627	0.16911	0.18373	0.22714		2.20833	1.43639	2.03742	0.18262	0.75138
Inorganics mg/L													
Nitrate	10 (NR)	**1.3**	**1.0**	**0.73**	<1.2	**3.0**	**6.4**	**4.8**	**18**	**19**	**16**	**4.7**	**13**
Sulfate	250 (NR)	**230**	**190**	**230**	**190**	**170**	**85**	**210**	**86**	**70**	**77**	**75**	**63**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.000061**	**0.000071**	**0.00009**	**0.000056**	**0.000081**	<0.00005	**0.00011**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00043**	**0.00051**	**0.00052**	**0.00039**	**0.00036**	**0.000096**	**0.00054**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	**0.000074**	<.000050	**0.00009**	**0.000074**	**0.000067**	<0.00005	**0.00014**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00007**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003
Total Pesticides		0.000565	0.0006	0.0007	0.000520	0.000508	0.000096	0.00086	BDL	BDL	BDL	BDL	BDL
pH (std units)		4.94	3.95	4.84	5.03	5.02	5.54	4.47/4.99	4.62	4.71	4.71	4.4	4.47
Specific Conductance (mS/cm)		0.499	0.573	0.517	0.460	0.657	0.339	0.51/0.42	0.375	0.484	0.414	0.307	0.239
Turbidity (NTUs)		0	3.9	9.51	2.46	60.3	101	7.1/5.14	0	0	0	0.2	9.8
DO (mg/L)		0	0.25	1.77	0.49	1.35	1.02		1.12	0.21	1.06	0.86	0.0
ORP (mV)		303	306	295	230	231	205		264	356	231	330	331

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-101**	**MW-101**	**MW-101**	**MW-101**	**MW-101**	**MW-101**	**MW-101**	**MW-101**	**MW-102**	**MW-102**	**MW-102**	**MW-102**
Sample Date	*Concentrations*	**11/10/2015**	**5/27/2015**	**11/11/2014**	**5/13/2014**	**11/12/2013**	**5/21/2013**	**11/12/2012**	**7/28/2010 & 9/13/2010**	**5/8/2018**	**10/31/2017**	**5/2/2017**	**11/8/2016**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.00827**	**0.0175**	**0.00850**	**0.0156**	**0.0112**	**0.00866**	**0.0331**	**0.022**	<0.01	<0.002	**0.00358**	**0.0259**
Total Lead	0.015	**0.00351**	**0.00292**	**0.00161**	**0.00679**	**0.00308**	**0.00251**	**0.00252**	**0.0035**	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**1.1**	**0.925**	**0.263**	**0.977**	**0.909**	**0.937**	**0.158**	**0.66**	**0.161**	**0.0113**	**0.0165**	**0.0702**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	<0.002	**0.00839**	**0.00791**	**0.00427**	**0.00404**	**0.00585**	**0.0328**	na	**0.00627**	<0.002	**0.00268**	**0.00337**
Dissolved Lead	0.015	**0.00125**	**0.00139**	<0.001	<0.001	**0.00210**	<0.001	**0.00201**	na	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**1.05**	**0.8**	**0.275**	**0.788**	**0.977**	**0.928**	**0.151**	na	**0.158**	**0.0104**	**0.0179**	**0.0337**
Total of Total Metals Concentrations		1.11178	0.94542	0.27311	0.99939	0.92328	0.94817	0.19362	0.6855	0.161	0.0113	0.02008	0.0961
Total of Dissolved Metals Concentrations		1.05125	0.80978	0.28291	0.79227	0.98314	0.93385	0.18581		0.16427	0.0104	0.02058	0.03707
Inorganics mg/L													
Nitrate	10 (NR)	**11**	**6.5**	**5.5**	**9.7**	**10**	**9.9**	**1.5**	**11**	**3.1**	**2.5**	**2.3**	<12
Sulfate	250 (NR)	**72**	**72**	**66**	**74**	**76**	**70**	**46**	**84**	**240**	**60**	**57**	**210**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00049	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000097	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0049	<0.003	<0.003	<0.003	<0.003
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
pH (std units)		4.86	4.65	3.84	4.43	4.65	4.71	4.62	4.32/4.5	4.64	5.34	5.67	5.32
Specific Conductance (mS/cm)		0.339	0.218	0.254	0.295	0.275	0.402	0.161	0.22/0.26	0.497	0.193	0.201	0.593
Turbidity (NTUs)		9.1	3.8	1.1	0.7	7.2	10.2	7.73	2.44/0.89	6.34	1.37	9.1	0.3
DO (mg/L)		0.01	0	0.96	2.39	0.97	2.08	0.49		1.83	0.85	1.9	2.8
ORP (mV)		76	311	330	223	3	272	289		256	196	186	279

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-102**	**MW-102**	**MW-102**	**MW-102**	**MW-102**	**MW-102**	**MW-102**	**MW-102**	**MW-102**	**MW-104A**	**MW-104A**	**MW-104A**
Sample Date	*Concentrations*	**6/2/2016**	**11/10/2015**	**5/27/2015**	**11/11/2014**	**5/13/2014**	**11/12/2013**	**5/21/2013**	**11/13/2012**	**7/29/2010 & 9/14/2010**	**5/9/2018**	**11/2/2017**	**5/3/2017**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0139**	**0.00303**	**0.00977**	**0.00626**	**0.0152**	**0.0115**	**0.00836**	**0.00934**	<0.005	<0.002	<0.002	**0.00396**
Total Lead	0.015	**0.00125**	<0.001	**0.00115**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0025**	<0.001	<0.001	**0.00129**
Total Zinc	2	**0.214**	**0.0205**	**0.129**	**0.0276**	**0.377**	**0.0342**	**0.0407**	**0.0245**	<0.02	<0.01	<0.01	<0.0100
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.0181**	<0.002	**0.00726**	**0.00433**	**0.00565**	<0.002	<0.002	**0.0089**	na	<0.002	<0.002	<0.002
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	na	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.225**	<0.01	**0.107**	**0.0277**	**0.293**	**0.0257**	**0.0227**	**0.0247**	na	<0.01	<0.01	<0.0100
Total of Total Metals Concentrations		0.22915	0.02353	0.13992	0.03386	0.3922	0.0457	0.04906	0.03384	0.0025	BDL	BDL	0.00525
Total of Dissolved Metals Concentrations		0.2431	BDL	0.11426	0.03203	0.29865	0.0257	0.0227	0.0336		BDL	BDL	BDL
Inorganics mg/L													
Nitrate	10 (NR)	**1.7**	**2.2**	**2.7**	<2.5	**2.5**	**3.0**	**4.0**	**2.3**	**5.1**	<0.25	<0.25	<0.25
Sulfate	250 (NR)	**260**	**46**	**200**	**190**	**270**	**280**	**58**	**45**	**160**	**86**	**85**	**77**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00049	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000097	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000049	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000097	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0049	<0.003	<0.003	<0.003
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
pH (std units)		5.06	5.88	5.5	5.01	4.82	4.38	5.37	5.62	4.84/5.54	7.06	6.53	6.54
Specific Conductance (mS/cm)		0.484	0.23	0.461	0.366	0.713	0.923	0.251	0.227	0.41/0.37	0.630	0.730	0.642
Turbidity (NTUs)		7.5	1.6	7.9	0.3	499	215	6.9	0	1.11/0.03	7.21	6.44	5.6
DO (mg/L)		0.53	4.58	1.58	0.0	3.46	3.43	4.39	3.07		0.53	0.0	0.33
ORP (mV)		281	196	286	222	312	205	228	202		-49	-82	-76

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104A**	**MW-104D**	**MW-104D**
Sample Date	*Concentrations*	**11/8/2016**	**6/3/2016**	**11/11/2015**	**6/1/2015**	**11/12/2014**	**5/14/2014**	**11/14/2013**	**5/28/2013**	**11/14/2012**	**9/15/2010**	**5/9/2018**	**11/2/2017**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005 UJ	<0.005
Total Copper	1.3	<0.002	**0.00219**	<0.002	<0.002	<0.002	**0.0244**	**0.00411**	**0.00427**	<0.002	<0.005	<0.01 UJ	**0.00386**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00548**	**0.00158**	<0.001	<0.001	<0.0015	<0.001 UJ	<0.001
Total Zinc	2	<0.01	<0.01	<0.010	**0.0109**	<0.010	**0.0503**	**0.0126**	**0.0112**	<0.01	<0.02	<0.050 UJ	<0.010
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005	<0.005
Dissolved Copper	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	na	<0.002	<0.002
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	na	<0.001	<0.001
Dissolved Zinc	2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	na	<0.01	<0.01
Total of Total Metals Concentrations		BDL	0.00219	BDL	BDL	BDL	0.08018	0.01829	0.01547	BDL	BDL	BDL	0.00386
Total of Dissolved Metals Concentrations		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		BDL	BDL
Inorganics mg/L													
Nitrate	10 (NR)	<12	<2.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	250 (NR)	**98**	**100**	**98**	**85**	**84**	**89**	**93**	**87**	**73**	**93**	<1.0	<1.0
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00047	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000094	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0047	<0.003	<0.003
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
pH (std units)		6.48	6.83	6.51	6.72	5.79	6.45	6.41	6.41	6.48	6.24	7.44	6.37
Specific Conductance (mS/cm)		0.923	0.704	0.911	0.766	0.870	0.874	0.797	0.859	0.876	0.74	2.85	2.79
Turbidity (NTUs)		0.2	0.0	9.8	0	3.6	15.7	9.13	0	0	1.49	15.8	17.3
DO (mg/L)		0.82	0.7	0	0	0.18	0.32	0.35	1.03	2		0.4	0.0
ORP (mV)		-60	-85	-60	-112	-95	-92	-128	-111	-98		-5.0	-33.0

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-104D**	**MW-105**
Sample Date	*Concentrations*	**5/3/2017**	**11/9/2016**	**6/6/2016**	**11/12/2015**	**6/3/2015**	**11/13/2014**	**5/15/2014**	**11/15/2013**	**5/28/2013**	**11/14/2012**	**9/15/2010**	**5/10/2018**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0042**	<0.005
Total Copper	1.3	**0.00456**	**0.0507**	**0.00701**	**0.0035**	**0.00553**	**0.00367**	**0.00560**	<0.002	**0.0107**	**0.00816**	<0.005	**0.00408 JB**
Total Lead	0.015	<0.001	**0.00829**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00114**	<0.0015	<0.001
Total Zinc	2	**0.0112**	**0.0693**	**0.0128**	**0.0103**	<0.010	<0.010	**0.0152**	**0.0327**	**0.0181**	**0.0164**	<0.02	**0.0135 JB**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005
Dissolved Copper	1.3	<0.002	<002	**0.00589**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	na	<0.005
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	na	<0.001
Dissolved Zinc	2	<0.01	<0.01	**0.0106**	<0.01	**0.025**	<0.01	<0.01	<0.01	<0.01	<0.01	na	<0.01
Total of Total Metals Concentrations		0.01576	0.12829	0.01981	0.0138	0.00553	0.00367	0.0208	0.0327	0.0288	0.0257	BDL	0.01758
Total of Dissolved Metals Concentrations		BDL	BDL	0.01649	BDL	0.025	BDL	BDL	BDL	BDL	BDL		BDL
Inorganics mg/L													
Nitrate	10 (NR)	< 2.5	<5.0	<2.5	<5	**0.34**	<2.5	<1.2	<0.25	<1.2	<2.5	<0.25	<0.25
Sulfate	250 (NR)	< 10	**21**	**16**	<20	<1.0	<10	<5.0	<1	<5	<10	<5	**360**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00047	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000069**	<0.00005	<0.00005	<0.000047	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000094	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0047	<0.003
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.000069	BDL	BDL	BDL	BDL
pH (std units)		6.55	6.24	6.91	6.46	6.58	6.06	6.41	6.25	6.38	6.44	6.51	6.02
Specific Conductance (mS/cm)		2.43	2.95	2.8	3.18	3.1	3.19	2.77	3.1	2.61	2.93	3.13	0.565
Turbidity (NTUs)		28.5	42.5	58.4	52.6	49.7	20.2	429	8.2	21.2	27.7	18	9.6
DO (mg/L)		0.34	0.9	0.0	0	0	0.0	0.24	0.41	1.59	2.27		4.33
ORP (mV)		-23	-2	-37	-30	-130	-67	-54	-69	-71	-67		154

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**	**MW-105**
Sample Date	*Concentrations*	**11/3/2017**	**5/4/2017**	**11/8/2016**	**6/6/2016**	**11/12/2015**	**6/1/2015**	**11/14/2014**	**5/13/2014**	**11/14/2013**	**5/21/2013**	**12/5/2012**	**11/15/2012**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00552**	<0.005	na	<0.005
Total Copper	1.3	**0.0117**	**0.00789**	**0.00754**	**0.00654**	**0.00455**	**0.00906**	**0.00404**	**0.0134**	**0.0112**	**0.00564**	na	**0.0114**
Total Lead	0.015	**0.00256**	<0.001	**0.00103**	**0.00148**	<0.001	**0.003**	**0.00154**	**0.00131**	**0.00487**	<0.001	na	<0.001
Total Zinc	2	**0.0230**	**0.0115**	**0.0244**	**0.0183**	**0.0132**	**0.0305**	**0.0109**	**0.0443**	**0.0217**	**0.0265**	na	**0.0475**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005
Dissolved Copper	1.3	<0.002	**0.00456**	**0.00645**	**0.00338**	**0.00343**	**0.005**	<0.002	**0.00676**	<0.002	<0.002	na	**0.00851**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	na	<0.001
Dissolved Zinc	2	<0.01	<0.0100	**0.0284**	<0.01	**0.0107**	**0.0188**	<0.01	**0.0381**	<0.01	**0.0216**	na	**0.0108**
Total of Total Metals Concentrations		0.03726	0.01939	0.03297	0.02632	0.01775	0.04256	0.01648	0.05901	0.04329	0.03214		0.0589
Total of Dissolved Metals Concentrations		BDL	0.00456	0.03485	0.00338	0.01413	0.0238	BDL	0.04486	BDL	0.0216		0.01931
Inorganics mg/L													
Nitrate	10 (NR)	**0.36**	<0.25	<12	<2.5	**0.37**	<0.25	<0.25	<0.25	<0.25	**0.28**	na	<0.25
Sulfate	250 (NR)	**180**	**390**	**140**	**360**	**110**	**310**	**97**	**220**	**160**	**230**	na	**71**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00014**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000075**	<0.00005	<0.00005	<0.00005	<0.00005	**0.0002**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	BDL	BDL	BDL	BDL	0.000075	BDL	BDL	BDL	BDL	0.00034
pH (std units)		5.69	5.27	6.06	5.19	5.98	5.76	5.13	5.22	5.31	5.69	6	6.13
Specific Conductance (mS/cm)		0.494	0.573	0.595	0.761	0.531	0.523	0.514	0.570	0.442	0.619	0.514	0.477
Turbidity (NTUs)		151.0	38.6	21.8	4.9	29.2	42.1	188	23.6	13.2	9.61	15.1	9.91
DO (mg/L)		0.0	2.34	2.13	0.38	0.01	0.17	1.1	2.36	1.48	0.95	2.98	4.37
ORP (mV)		170	331	119	144	174	195	131	129	127	107	63.3	75

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-105**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**	**MW-106D**
Sample Date	*Concentrations*	**9/15/2010**	**5/11/2018**	**11/6/2017**	**5/8/2017**	**11/9/2016**	**6/7/2016**	**11/13/2015**	**6/2/2015**	**11/13/2014**	**5/19/2014**	**11/15/2013**	**5/29/2013**
Metals mg/L													
Total Arsenic	0.01	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0057**	**0.00473 JB**	**0.00373**	**0.00426**	**0.00363**	**0.00681**	**0.00382**	**0.00529**	**0.00298**	**0.00456**	**0.00897**	**0.00481**
Total Lead	0.015	<0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00146**	**0.00124**
Total Zinc	2	**0.024**	**0.205**	**0.240**	**0.205**	**0.202**	**0.295**	**0.277**	**0.273**	**0.182**	**0.167**	**0.239**	**0.183**
Dissolved Arsenic	0.01	na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	na	<0.01	**0.00435**	**0.00339**	**0.00313**	**0.00514**	**0.00269**	**0.00357**	<0.002	**0.00347**	**0.00492**	**0.00427**
Dissolved Lead	0.015	na	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	na	**0.206**	**0.229**	**0.0643**	**0.196**	**0.267**	**0.241**	**0.28**	**0.172**	**0.178**	**0.168**	**0.162**
Total of Total Metals Concentrations		0.0297	0.20973	0.24373	0.20926	0.20563	0.30181	0.28082	0.27829	0.18498	0.17156	0.24943	0.18905
Total of Dissolved Metals Concentrations			0.206	0.23335	0.06769	0.19913	0.27214	0.24369	0.28357	0.172	0.18147	0.17292	0.16627
Inorganics mg/L													
Nitrate	10 (NR)	<0.25	**0.42**	**0.80**	**0.82**	<2.5	<2.5	<2.5	**0.61**	**0.47**	**0.37**	<2.5	<1.2
Sulfate	250 (NR)	**97**	**320**	**310**	**350**	**400**	**390**	**380**	**380**	**440**	**340**	**390**	**400**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.000047	**0.00063**	**0.0062**	**0.0066**	**0.0071**	**0.0082**	**0.0079**	**0.0066**	**0.0063**	**0.0066**	**0.0059**	**0.0076**
alpha-Chlordane	0.002	<0.00047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.000047	**0.00023**	**0.0020**	**0.002**	**0.0021**	**0.0024**	**0.0024**	**0.0022**	**0.0024**	**0.0022**	**0.0022**	**0.0021**
delta-BHC	0.00005(DL)	<0.000047	**0.00066**	**0.0060**	**0.0076**	**0.0083**	**0.0098**	**0.01**	**0.0079**	<0.000050	**0.008**	**0.0079**	**0.0075**
Dieldrin	0.0001(DL)	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.000047	**0.00038**	**0.0040**	**0.0041**	**0.004**	**0.0045**	**0.0041**	**0.0038**	**0.0035**	**0.0033**	**0.0031**	**0.0042**
gamma-Chlordane	0.002	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.000047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.000094	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.0047	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		BDL	0.00190	0.01820	0.02030	0.02150	0.02490	0.0244	0.0205	0.0122	0.0201	0.0191	0.0214
pH (std units)		5.57	6.33	6.15	6.14	6.17	6.53	6.09	6.46	5.84	6.1	6.05	6.09
Specific Conductance (mS/cm)		0.36	0.715	0.785	0.994	1.08	0.784	1.02	0.963	1.29	1.04	1.15	1.25
Turbidity (NTUs)		9.7	0.37	0.0	0	0.0	0.0	0	0	0.0	0	0	0
DO (mg/L)			0.8	0.0	0.83	1.7	0.0	0.11	0	7.88	1.43	3.54	2.25
ORP (mV)			116	144	142	160	1.62	186	172	-73	206	111	129

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-106D**	**MW-106D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**
Sample Date	*Concentrations*	**11/15/2012**	**9/15/2010**	**5/9/2018**	**11/3/2017**	**5/4/2017**	**11/9/2016**	**6/6/2016**	**11/12/2015**	**6/1/2015**	**11/13/2014**	**5/21/2014**	**11/18/2013**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.00471**	<0.005	<0.01	**0.00267**	**0.0103**	**0.00439**	**0.0118**	**0.00359**	**0.00511**	**0.00407**	**0.00754**	**0.0101**
Total Lead	0.015	<0.001	<0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00203**
Total Zinc	2	**0.16**	**0.11**	<0.05	**0.0125**	**0.0215**	**0.0114**	**0.0261**	**0.0117**	<0.01	**0.0235**	**0.0231**	**0.0176**
Dissolved Arsenic	0.01	<0.005	na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.00233**	na	<0.002	<0.002	**0.00533**	**0.00436**	**0.00948**	**0.00207**	**0.00328**	<0.002	**0.00458**	**0.012**
Dissolved Lead	0.015	<0.001	na	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00213**
Dissolved Zinc	2	**0.149**	na	<0.01	<0.01	**0.0146**	<0.01	<0.01	<0.01	<0.01	**0.0197**	**0.0141**	**0.0179**
Total of Total Metals Concentrations		0.16471	0.11	BDL	0.01517	0.0318	0.01579	0.0379	0.01529	0.00511	0.02757	0.03064	0.02973
Total of Dissolved Metals Concentrations		0.15133		BDL	BDL	0.01993	0.00436	0.00948	0.00207	0.00328	0.0197	0.01868	0.03203
Inorganics mg/L													
Nitrate	10 (NR)	**1.4**	**1.4**	**2.4**	**2.2**	**2.3**	**2.3**	**2.4**	**3.2**	**3.5**	**4.2**	**5.2**	**4.5**
Sulfate	250 (NR)	**380**	**430**	**91**	**92**	**110**	**140**	**140**	**160**	**170**	**200**	**180**	**210**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0068**	**0.0082**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0019**	**0.0019**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	**0.0082**	**0.01**	<0.00005	<0.00005	<0.00005	<0.00005	**0.000089**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.0043**	**0.0051**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.000047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.000094	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.0047	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.0212	0.0252	BDL	BDL	BDL	BDL	0.000089	BDL	BDL	BDL	BDL	BDL
pH (std units)		6.2	6.28	6.19	5.79	5.89	5.78	5.96	6.46	6.41	5.21	5.6	5.60
Specific Conductance (mS/cm)		1.27	1.25	0.273	0.323	0.302	0.465	0.361	0.455	0.443	0.641	0.678	0.678
Turbidity (NTUs)		0.9	0	6.08	0.0	8.1	4.1	0.3	0	1.6	0.2	4	0
DO (mg/L)		0.49		2.33	1.76	3.34	4.34	0.54	27.7	6.92	2.28	2.35	1.67
ORP (mV)		-53		175	193	347	180	167	190	235	216	208	223

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-107D**	**MW-107D**	**MW-107D**	**MW-107D**	**MW-108**	**MW-108**	**MW-108**	**MW-108**	**MW-108**	**MW-108**	**MW-108**	**MW-108**
Sample Date	*Concentrations*	**5/22/2013**	**12/5/2012**	**11/19/2012**	**9/15/2010**	**5/10/2018**	**11/2/2017**	**5/3/2017**	**11/10/2016**	**6/2/2016**	**11/11/2015**	**5/28/2015**	**11/12/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	na	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.00257**	na	**0.00614**	<0.005	**0.179 J**	**0.174**	**0.231**	**0.443**	**0.2**	**0.17**	**0.151**	**0.174**
Total Lead	0.015	<0.001	na	<0.001	<0.0015	<0.001	<0.001	<0.001	**0.00396**	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**0.0155**	na	**0.0151**	<0.02	**2.37**	**2.32**	**2.78**	**3.540**	**2.420**	**1.96**	**2.02**	**2.470**
Dissolved Arsenic	0.01	<0.005	na	<0.005	na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.00295**	na	**0.00574**	na	**0.198 J**	**0.164**	**0.206**	**0.242**	**0.238**	**0.182**	**0.161**	**0.138**
Dissolved Lead	0.015	<0.001	na	<0.001	na	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	<0.01	na	**0.0151**	na	**2.4**	**2.19**	**2.49**	**3.26**	**2.69**	**2.22**	**2.24**	**2.3**
Total of Total Metals Concentrations		0.01807		0.02124	BDL	2.549	2.494	3.011	3.98696	2.62	2.13	2.171	2.644
Total of Dissolved Metals Concentrations		0.00295		0.02084		2.598	2.354	2.696	3.502	2.928	2.402	2.401	2.438
Inorganics mg/L													
Nitrate	10 (NR)	**6.0**	na	**5.0**	**4.7**	<0.25	<0.25	**0.28**	**0.29**	<0.25	<0.25	<0.25	<0.25
Sulfate	250 (NR)	**230**	na	**200**	**190**	**260**	**240**	**230**	**330**	**340**	**300**	**260**	**200**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.000095	**0.00014**	<0.0001	<0.0001	<0.0001	**0.0001**	**0.00011**	**0.0001**	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.000048	**0.00067**	**0.0029**	**0.0025**	**0.0052**	**0.0073**	**0.0055**	**0.0063**	**0.0029**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.000048	**0.0015**	**0.00093**	**0.0015**	**0.0014**	**0.0016**	**0.0012**	**0.0012**	**0.0011**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	**0.000056**	<0.000048	**0.0001**	**0.00093**	**0.0042**	**0.0016**	**0.0018**	**0.0033**	**0.0037**	**0.0072**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	**0.00012**	**0.00017**	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.000048	**0.00029**	**0.00020**	**0.00018**	**0.00031**	**0.00028**	**0.00043**	**0.00046**	**0.00018**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005
Total Pesticides		BDL	BDL	0.000056	BDL	0.00270	0.00496	0.00838	0.00863	0.01125	0.01054	0.01176	0.01138
pH (std units)		5.68	5.53	5.76	5.52	5.32	5.23	5.17	4.82	5.57	5.81	5.63	5.15
Specific Conductance (mS/cm)		0.699	0.646	0.643	0.58	0.5	0.514	0.588	0.757	0.633	0.603	0.498	0.334
Turbidity (NTUs)		0	0	0.02	0	0	1.0	0.7	5.8	7.6	9.2	7.2	8.7
DO (mg/L)		1.65	0.95	0.06		0.77	0.29	0.84	1.0	0.0	0	0.01	0
ORP (mV)		200	213.8	202		182	208	202	311	249	245	296	333

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-108**	**MW-108**	**MW-108**	**MW-108**	**MW-108**	**MW-109**	**MW-109**	**MW-109**	**MW-109**	**MW-109**	**MW-109**	**MW-109**
Sample Date	*Concentrations*	**5/15/2014**	**11/13/2013**	**5/23/2013**	**11/13/2012**	**7/29/2010 &9/14/2010**	**5/15/2018**	**11/7/2017**	**5/9/2017**	**11/10/2016**	**6/8/2016**	**11/16/2015**	**6/3/2015**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.0025	**0.206**	**0.0602**	**0.0731**	**0.0296**	**0.278**	**0.116**	**0.181**
Total Copper	1.3	**0.155**	**0.241**	**0.225**	**0.242**	**0.3**	**0.039**	**0.113**	**0.109**	**0.164**	**0.0351**	**0.0822**	**0.0782**
Total Lead	0.015	<0.001	**0.00253**	<0.001	<0.001	<0.0015	**0.453**	**0.668**	**0.69**	**0.636**	**0.707**	**0.901**	**1.02**
Total Zinc	2	**2.24**	**2.86**	**2.75**	**2.81**	**3.6**	**21.9**	**28.7**	**26.2**	**27**	**18.6**	**23.4**	**25.7**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	na	**0.199**	**0.0609**	**0.0603**	**0.0159**	**0.243**	**0.112**	**0.158**
Dissolved Copper	1.3	**0.158**	**0.208**	**0.2**	**0.239**	na	**0.0302**	**0.131**	**0.0881**	**0.158**	**0.0348**	**0.0656**	**0.0732**
Dissolved Lead	0.015	<0.001	**0.00222**	<0.001	<0.001	na	**0.00307**	**0.316**	**0.28**	**0.162**	**0.00826**	**0.71**	**0.565**
Dissolved Zinc	2	**2.33**	**2.33**	**2.44**	**2.58**	na	**21**	**28.2**	**25.3**	**25.8**	**17.8**	**19**	**29.2**
Total of Total Metals Concentrations		2.395	3.10353	2.975	3.052	3.9	22.598	29.5412	27.0721	27.8296	19.6201	24.4992	26.9792
Total of Dissolved Metals Concentrations		2.488	2.54022	2.64	2.819		21.23227	28.7079	25.7284	26.1359	18.08606	19.8876	29.9962
Inorganics mg/L													
Nitrate	10 (NR)	**0.35**	<1.2	<1.2	**0.66**	**0.42**	<0.25	**1.4**	**0.96**	**7.4**	<2.5	<25	<2.5
Sulfate	250 (NR)	**260**	**93**	**220**	**210**	**320**	**1500**	**1200**	**1500**	**1400**	**1400**	**1400**	**1400**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0048**	**0.0021**	**0.0028**	**0.0009**	**0.0058**	**0.045**	**0.031**	**0.035**	**0.038**	**0.032**	**0.034**	**0.029**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0018**	**0.00081**	**0.00077**	**0.00051**	**0.0024**	**0.0039**	**0.0042**	**0.004**	**0.0047**	**0.0028**	**0.0035**	**0.0033**
delta-BHC	0.00005(DL)	**0.0059**	**0.0006**	**0.00044**	**0.00033**	**0.0018**	**0.0037**	**0.0046**	**0.0042**	**0.0054**	**0.003**	**0.0038**	**0.0032**
Dieldrin	0.0001(DL)	<0.0001	**0.00035**	<0.0001	<0.0001	**0.000098 P**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00025**	**0.00017**	**0.00022**	**0.000085**	**0.0002 P**	**0.026**	**0.019**	**0.021**	**0.022**	**0.018**	**0.02**	**0.018**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005
Total Pesticides		0.01275	0.00403	0.00423	0.001825	0.0103	0.07860	0.05880	0.06420	0.07010	0.05580	0.0613	0.0535
pH (std units)		5.27	4.55	4.71	4.74	4.3/5.14	4.78	4.69	4.64	4.64	4.16	4.56	4.5
Specific Conductance (mS/cm)		0.684	0.566	0.566	0.533	0.72/0.68	2.46	2.55	2.6	2.38	2.85	2.7	2.42
Turbidity (NTUs)		10.1	4.64	0	9	2.15/0.8	0	3.2	0	0.0	0.0	0	3.2
DO (mg/L)		1.92	0.46	0.84	0.98		0.38	1.57	0.82	1.44	0.5	0	0
ORP (mV)		257	238	299	251		147	176	193	177	136	160	206

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-109**	**MW-109**	**MW-109**	**MW-109**	**MW-109**	**MW-109**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**
Sample Date	*Concentrations*	**11/18/2014**	**5/15/2014**	**11/15/2013**	**5/23/2013**	**11/16/2012**	**9/14/2010**	**5/11/2018**	**11/2/2017**	**5/5/2017**	**11/10/2016**	**6/3/2016**	**11/11/2015**
Metals mg/L													
Total Arsenic	0.01	**0.0342**	**0.292**	**0.0533**	**0.253**	**0.211**	**0.061**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.178**	**0.0817**	**0.0737**	**0.00569**	**0.0735**	**0.079**	**0.386**	**0.314**	**0.423**	**0.862**	**0.311**	**0.284**
Total Lead	0.015	**0.932**	**3.83**	**0.738**	**0.358**	**1.53**	**0.61**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**25.3**	**21.2**	**35.5**	**14.3**	**18.7**	**25**	**5.26**	**4.20**	**5.34**	**6.58**	**3.87**	**3.74**
Dissolved Arsenic	0.01	**0.0258**	**0.208**	**0.0382**	**0.22**	**0.16**	na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.241**	**0.0103**	**0.0693**	**0.00505**	**0.0218**	na	**0.396**	**0.315**	**0.306**	**0.3**	**0.285**	**0.293**
Dissolved Lead	0.015	**0.480**	**0.224**	**0.285**	**0.0175**	**0.436**	na	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**25.1**	**22.2**	**25.6**	**12.4**	**17.6**	na	**5.19**	**4.34**	**3.83**	**3.61**	**3.61**	**3.96**
Total of Total Metals Concentrations		26.4442	25.4037	36.365	14.91669	20.5145	25.75	5.646	4.514	5.763	7	4	4.024
Total of Dissolved Metals Concentrations		25.8468	22.6423	25.9925	12.64255	18.2178		5.586	4.655	4.136	3.91	3.895	4.253
Inorganics mg/L													
Nitrate	10 (NR)	<12	<1.2	**9.6**	<12	<0.25	**0.38**	**2.3**	**2.8**	**3.8**	**4**	**4.7**	**4.0**
Sulfate	250 (NR)	**1200**	**1500**	**1500**	**1300**	**1100**	**1300**	**320**	**290**	**320**	**320**	**270**	**310**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.033**	**0.033**	**0.024**	**0.03**	**0.03**	**0.0028**	**0.00042**	**0.00099**	**0.0012**	**0.00052**	**0.00041**	**0.0009**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0046**	**0.0033**	**0.0038**	**0.0035**	**0.0037**	<0.00048	**0.00052**	**0.00031**	**0.00036**	**0.00035**	**0.00025**	**0.00032**
delta-BHC	0.00005(DL)	**0.0058**	**0.0039**	**0.004**	**0.0037**	**0.0049**	<0.00048	**0.0007**	**0.0016**	**0.0018**	**0.0013**	**0.00071**	**0.0018**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.022**	**0.019**	**0.015**	**0.017**	**0.024**	**0.0019**	**0.00043**	**0.0012**	**0.0012**	**0.00046**	**0.00044**	**0.001**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005
Total Pesticides		0.0654	0.0592	0.0468	0.0542	0.0626	0.0047	0.00207	0.00410	0.00456	0.00263	0.00181	0.0040
pH (std units)		4.31	4.19	4.8	4.65	4.74	4.56	5.1	5.18	5.12	5.02	5.01	5.68
Specific Conductance (mS/cm)		2.86	2.86	2.94	2.72	2.81	2.71	0.634	0.649	0.805	0.757	0.787	0.703
Turbidity (NTUs)		0	4.8	0	3.95	0	0.1	0	0.0	0	8.0	0.0	0
DO (mg/L)		2.08	0.88	0.72	0.7	0.58		0.6	0.0	0.88	0.0	0.28	26.7
ORP (mV)		229	179	190	73	130		169	172	158	169	212	172

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-110**	**MW-111**	**MW-111**	**MW-111**
Sample Date	*Concentrations*	**5/29/2015**	**11/12/2014**	**5/15/2014**	**1/8/2014**	**10/9/2013**	**7/16/2013**	**4/16/2013**	**11/14/2012**	**7/29/2010 & 9/14/2010**	**5/15/2018**	**11/8/2017**	**5/9/2017**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005
Total Copper	1.3	**0.357**	**0.352**	**0.323**	**0.395**	**0.376**	**0.396**	**0.4**	**0.372**	**0.39**	**0.0391**	**0.0403**	**0.0306**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0015**	<0.001	<0.001	<0.001
Total Zinc	2	**5.09**	**5.1**	**5.29**	**6.29**	**5.05**	**5.69**	**6.92**	**5.9**	**5.7**	**6.82**	**8.38**	**6.21**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.35**	**0.291**	**0.31**	**0.405**	**0.323**	**0.381**	**0.38**	**0.375**	na	**0.0277**	**0.0344**	**0.022**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	na	<0.001	<0.001	<0.001
Dissolved Zinc	2	**4.81**	**4.89**	**4.54**	**5.28**	**4.47**	**5.19**	**6.25**	**4.81**	na	**6.18**	**6.24**	**5.86**
Total of Total Metals Concentrations		5.447	5.452	5.613	6.685	5.426	6.086	7.32	6.272	6.0915	6.8591	8.4203	6.2406
Total of Dissolved Metals Concentrations		5.16	5.181	4.85	5.685	4.793	5.571	6.63	5.185		6.2077	6.2744	5.882
Inorganics mg/L													
Nitrate	10 (NR)	**3.9**	**3.5**	**4**	**4.1**	**2.9**	**4.0**	**4.4**	**4.8**	**9.8**	<0.25	<0.25	<0.25
Sulfate	250 (NR)	**320**	**250**	**300**	**330**	**270**	**310**	**340**	**300**	**310**	**450**	**470**	**490**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00076**	**0.0005**	**0.00043**	**0.00088**	**0.00045**	**0.0006**	**0.0012**	**0.00069**	**0.00047**	**0.032**	**0.020**	**0.018**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00048	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00032**	**0.00033**	**0.00031**	**0.00035**	**0.00027**	**0.0004**	**0.00036**	**0.00044**	**0.00043**	**0.0067**	**0.0062**	**0.0055**
delta-BHC	0.00005(DL)	**0.0015**	**0.0014**	**0.0011**	**0.0017**	**0.00089**	**0.0014**	**0.0022**	**0.0013**	**0.00088**	**0.054**	**0.051**	**0.046**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000095	**0.00012**	**0.00015**	**0.00014**
gamma-BHC	0.0002	**0.00086**	**0.0006**	**0.00057**	**0.0012**	**0.00054**	**0.0008**	**0.0013**	**0.00067**	**0.00055**	**0.036**	**0.021**	**0.018**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000048	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.000095	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0048	<0.003	<0.003	<0.003
Total Pesticides		0.0034	0.0028	0.0024	0.0041	0.0022	0.0032	0.00506	0.0031	0.00233	0.12882	0.09835	0.08764
pH (std units)		5.62	5.27	5.19	5.16	4.85	5.13	5.19	5.30	5.03/5.04	6.26	5.76	5.74
Specific Conductance (mS/cm)		0.631	0.498	0.844	0.697	0.731	0.765	0.84	1.02	0/0.94	0.804	1.09	1.22
Turbidity (NTUs)		2.7	4.1	0	0.92	0.22	10.7	1.2	0	0.22/0.6	0.91	0.0	0
DO (mg/L)		0	0	1.07	0.58	0.58	0.44	0.51	0.41		0.72	0.0	0.87
ORP (mV)		268	310	149	177.7	208	219.4	235.3	143		106	128	120

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**	**MW-111**
Sample Date	*Concentrations*	**11/10/2016**	**6/8/2016**	**11/16/2015**	**6/3/2015**	**11/18/2014**	**5/19/2014**	**1/8/2014**	**10/9/2013**	**7/16/2013**	**4/17/2013**	**11/16/2012**
Metals mg/L												
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0225**	**0.024**	**0.0241**	**0.0283**	**0.0351**	**0.0357**	**0.0242**	**0.0197**	**0.0231**	**0.0276**	**0.0255**
Total Lead	0.015	**0.00221**	<0.001	<0.001	<0.001	<0.001	**0.0011**	<0.001	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**4.78**	**4.24**	**5.45**	**5.4**	**4.96**	**7.17**	**7.3**	**4.75**	**5.42**	**6.44**	**5.1**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Dissolved Copper	1.3	**0.0217**	**0.0228**	**0.032**	**0.0503**	**0.0336**	**0.0299**	**0.0237**	**0.0153**	**0.0218**	**0.0271**	**0.0206**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002
Dissolved Zinc	2	**4.48**	**3.99**	**4.36**	**5.65**	**4.55**	**5.47**	**5.40**	**4.31**	**4.96**	**6.0**	**4.83**
Total of Total Metals Concentrations		4.80471	4.264	5.4741	5.4283	4.9951	7.2068	7.3242	4.7697	5.4431	6.4676	5.1255
Total of Dissolved Metals Concentrations		4.5017	4.0128	4.392	5.7003	4.5836	5.4999	5.4237	4.3253	4.9818	6.0271	4.8506
Inorganics mg/L												
Nitrate	10 (NR)	<2.5	<2.5	<5.0	<0.25	<5.0	**0.3**	<1.2	<2.5	<1.2	<1.2	**0.4**
Sulfate	250 (NR)	**450**	**430**	**500**	**560**	**450**	**500**	**510**	**440**	**440**	**480**	**440**
Organochlorine Pesticides mg/L												
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.017**	**0.0053**	**0.019**	**0.01**	**0.030**	**0.039**	**0.014**	**0.015**	**0.02**	**0.012**	**0.012**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0059**	**0.0052**	**0.0066**	**0.0043**	**0.0069**	**0.0058**	**0.0069**	**0.0048**	**0.0051**	**0.0045**	**0.0051**
delta-BHC	0.00005(DL)	**0.046**	**0.014**	**0.059**	**0.034**	**0.11**	**0.1**	**0.052**	**0.065**	**0.049**	**0.021**	**0.021**
Dieldrin	0.0001(DL)	**0.00015**	**0.00012**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.018**	**0.0079**	**0.03**	**0.017**	**0.06**	**0.078**	**0.029**	**0.028**	**0.035**	**0.014**	**0.0082**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.0025	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005
Total Pesticides		0.08705	0.03252	0.1146	0.0653	0.2069	0.2228	0.10190	0.11280	0.10910	0.0515	0.0463
pH (std units)		5.61	5.63	6.11	5.96	5.34	5.76	5.74	5.55	5.74	5.81	5.88
Specific Conductance (mS/cm)		1.01	1.18	1.27	1.18	1.43	1.39	1.052	1.079	1.113	1.207	1.32
Turbidity (NTUs)		0.0	0.0	0.7	0	0.7	0	0.12	0.26	3.7	1.2	0
DO (mg/L)		1.78	0.56	0.7	0	0.0	1.21	0.73	0.94	0.65	0.6	0.46
ORP (mV)		83	108	98	107	104	107	129.1	167.9	180.1	151.6	69

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-111**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**	**MW-112**
Sample Date	*Concentrations*	**7/29/2010 & 9/14/2010**	**5/10/2018**	**11/1/2017**	**5/2/2017**	**11/9/2016**	**6/2/2016**	**11/10/2015**	**5/28/2015**	**11/11/2014**	**5/14/2014**	**11/13/2013**	**5/22/2013**
Metals mg/L													
Total Arsenic	0.01	<0.0025	**0.0109**	**0.0109**	**0.0121**	**0.0116**	**0.00849**	**0.00937**	**0.00783**	**0.0117**	**0.00684**	**0.013**	**0.0115**
Total Copper	1.3	**0.039**	**0.0525**	**0.0339**	**0.0383**	**0.0436**	**0.0421**	**0.0311**	**0.0504**	**0.0462**	**0.0536**	**0.0775**	**0.0794**
Total Lead	0.015	<0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00109**	**0.00132**	**0.0026**
Total Zinc	2	**4.4**	**2.69**	**1.00**	**1.01**	**0.965**	**1.50**	**1.12**	**2.13**	**1.10**	**1.62**	**1.61**	**2.45**
Dissolved Arsenic	0.01	na	<0.005	**0.00987**	**0.0108**	**0.011**	**0.00906**	**0.0101**	**0.00969**	**0.0121**	**0.00651**	**0.0106**	**0.00747**
Dissolved Copper	1.3	na	**0.0487**	**0.0277**	**0.032**	**0.0383**	**0.0439**	**0.0324**	**0.0455**	**0.0415**	**0.0521**	**0.0655**	**0.0499**
Dissolved Lead	0.015	na	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	na	**2.46**	**0.922**	**0.935**	**0.927**	**1.570**	**1.21**	**2.09**	**1.130**	**1.65**	**1.26**	**2.35**
Total of Total Metals Concentrations		4.439	2.7534	1.0448	1.0604	1.0202	1.55059	1.1605	2.1882	1.1579	1.6815	1.7018	2.5435
Total of Dissolved Metals Concentrations			2.5087	0.95957	0.9778	0.9763	1.62296	1.2525	2.14519	1.1836	1.70861	1.3361	2.40737
Inorganics mg/L													
Nitrate	10 (NR)	<0.25	**4.1**	2.1	<12	**0.63**	<0.25	<2.5	**1.5**	<2.5	**0.43**	<2.5	**1.8**
Sulfate	250 (NR)	**240**	**410**	**250**	**140**	**150**	**330**	**250**	**370**	**170**	**620**	**480**	**580**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.014**	**0.00084**	**0.00033**	**0.00054**	**0.00049**	**0.0017**	**0.0031**	**0.00078**	**0.00091**	**0.0021**	**0.00034**	**0.013**
alpha-Chlordane	0.002	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.01	**0.00024**	**0.00083**	**0.004**	**0.00099**	**0.044**	**0.003**	**0.0068**	**0.0021**	**0.022**	**0.0063**	**0.016**
delta-BHC	0.00005(DL)	**0.03**	<0.00005	**0.000073**	**0.00027**	**0.00011**	**0.0019**	**0.0026**	**0.00064**	**0.00021**	**0.0026**	**0.0002**	**0.015**
Dieldrin	0.0001(DL)	**0.00014**	<0.0001	<0.0001	<0.0001	<0.0001	**0.00028**	<0.0001	<0.0001	<0.00010	**0.00026**	<0.0001	**0.0005**
gamma-BHC	0.0002	<0.01	**0.00018**	**0.000054**	**0.000091**	**0.000068**	**0.00077**	**0.00095**	**0.00014**	**0.00013**	**0.0007**	**0.000093**	**0.0056**
gamma-Chlordane	0.002	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.100	<0.100	<0.005	<0.005
Total Pesticides		0.04414	0.00126	0.00129	0.00490	0.00166	0.04865	0.00965	0.00836	0.00335	0.02766	0.006933	0.0501
pH (std units)		5.79	5.64	5.45	5.5	5.98	5.54	6.52	6.08	5.87	5.53	5.50	5.51
Specific Conductance (mS/cm)		1.22	0.794	0.506	0.449	0.529	0.835	0.673	0.849	0.354	1.23	1.18	1.6
Turbidity (NTUs)		0.81	0	0.96	7.1	2.4	3.9	2.9	0	3.0	3	5.81	9.9
DO (mg/L)			0.84	0.0	3.59	0.5	3.02	0	0	0.0	2.07	0.47	1.58
ORP (mV)			138	213	206	184	224	167	174	189	177	185	149

TABLE 3: SUMM TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-112**	**MW-112**	**MW-113**	**MW-113**	**MW-113**	**MW-113**	**MW-113**	**MW-113**	**MW-113**	**MW-113**	**MW-113**	**MW-113**
Sample Date	*Concentrations*	**11/13/2012**	**7/28/2010 & 9/13/2010**	**5/14/2018**	**11/6/2017**	**5/8/2017**	**11/10/2016**	**6/7/2016**	**11/16/2015**	**6/2/2015**	**11/17/2014**	**5/15/2014**	**11/15/2013**
Metals mg/L													
Total Arsenic	0.01	**0.0144**	**0.015**	**0.00555**	<0.005	<0.005	<0.005	<0.005	**0.0431**	**0.0177**	**0.039**	<0.005	**0.0135**
Total Copper	1.3	**0.0546**	**0.054**	**10.4**	**9.16**	**10**	**16.8**	**18.9**	**11.4**	**13.2**	**19.5**	**26.7**	**19.4**
Total Lead	0.015	**0.0011**	<0.0015	**0.00519**	**0.00279**	**0.00368**	**0.00328**	**0.00538**	<0.001	**0.0185**	**0.00931**	**0.0111**	**0.0166**
Total Zinc	2	**0.563**	**1**	**57.5 J**	**68.8**	**73.5**	**94.1**	**92.2**	**65.6**	**4.1**	**124**	**134**	**99.9**
Dissolved Arsenic	0.01	**0.0134**	na	**0.00585**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0189**	**0.05**	<0.005	<0.005
Dissolved Copper	1.3	**0.0441**	na	**9.08**	**9.11**	**9.8**	**14.7**	**21.1**	**11.9**	**12.4**	**25.2**	**26.4**	**12.9**
Dissolved Lead	0.015	<0.001	na	**0.00506**	<0.001	**0.0029**	**0.00303**	**0.00424**	**0.00325**	**0.00545**	**0.0116**	**0.0104**	**0.0104**
Dissolved Zinc	2	**0.559**	na	**70 J**	**66.3**	**23.9**	**93.3**	**122**	**70**	**72.2**	**146**	**132**	**92.3**
Total of Total Metals Concentrations		0.6331	1.069	67.91074	77.96279	83.50368	110.90328	111.10538	77.0431	17.3362	143.54831	160.7111	119.3301
Total of Dissolved Metals Concentrations		0.6165		79.09091	75.41	33.7029	108.00303	143.10424	81.90325	84.62435	171.2616	158.4104	105.2104
Inorganics mg/L													
Nitrate	10 (NR)	**1.5**	**0.89**	**2.6 JH**	**2.8**	**2.2**	<5.0	<2.5	<25	<2.5	**1.2**	<1.2	<2.5
Sulfate	250 (NR)	**100**	**220**	**1000 JL**	**890**	**1400**	**1800**	**1600**	**1400**	**810**	**2000**	**2600**	**2500**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.000076**	<0.0025	**0.0001 JL**	**0.00021**	**0.00031**	**0.00045**	**0.00075**	**0.0002**	**0.00025**	**0.00032**	**0.00048**	**0.00029**
alpha-Chlordane	0.002	<0.00005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00039**	**0.031**	**0.00039 JL**	**0.00036**	**0.0008**	**0.00096**	**0.0012**	**0.00069**	**0.00076**	**0.00093**	**0.0010**	**0.00067**
delta-BHC	0.00005(DL)	<0.00005	<0.0025	**0.000096 JL**	**0.000096**	**0.00027**	**0.00051**	**0.00062**	**0.00018**	**0.00017**	**0.00026**	**0.00029**	**0.00018**
Dieldrin	0.0001(DL)	<0.0001	**0.00012**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	**0.00059**	**0.00015 JL**	**0.00016**	**0.00034**	**0.00039**	**0.00068**	**0.00024**	**0.00026**	**0.00033**	**0.00045**	**0.00029**
gamma-Chlordane	0.002	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.000466	0.03171	0.00074	0.00083	0.00172	0.00231	0.00325	0.00131	0.00144	0.00184	0.00222	0.00143
pH (std units)		5.49	5.52/5.51	3.90	3.72	3.75	3.59	3.22	3.64	3.68	3.45	3.31	3.56
Specific Conductance (mS/cm)		0.731	0.55/0.57	1.37	1.56	1.98	2.64	2.62	2.156	1.89	3.37	3.47	3.36
Turbidity (NTUs)		9.89	5.1/4.04	5.69	8.6	4.5	0.7	0.0	0.8	9.2	3.3	16.1	15.1
DO (mg/L)		0.78		0.53	0.0	0.41	1.1	1.07	0.17	0.09	0.0	0.47	0.42
ORP (mV)		143		347	371	421	387	371	421.6	366	378	404	349

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-113**	**MW-113**	**MW-113**	**MW-114**	**MW-114**	**MW-114**	**MW-114**	**MW-114**	**MW-114**	**MW-114**	**MW-114**	**MW-114**
Sample Date	*Concentrations*	**5/24/2013**	**11/15/2012**	**9/15/2010**	**5/14/2018**	**11/6/2017**	**5/8/2017**	**11/10/2016**	**6/7/2016**	**11/16/2015**	**6/2/2015**	**11/18/2014**	**5/15/2014**
Metals mg/L													
Total Arsenic	0.01	**0.0235**	<0.005	**0.023**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**20.3**	**12.9**	**15**	**1.93**	**1.59**	**1.65**	**1.67**	**1.22**	**1.57**	**1.48**	**1.55**	**1.28**
Total Lead	0.015	**0.0052**	**0.00812**	**0.0019**	**0.00197**	<0.001	<0.001	**0.00124**	**0.00142**	**0.00295**	**0.00159**	**0.00200**	**0.00388**
Total Zinc	2	**114**	**69.5**	**95**	**8.47 J**	**9.04**	**8.39**	**7.82**	**4.78**	**7.53**	**7.93**	**6.26**	**8.12**
Dissolved Arsenic	0.01	**0.0234**	<0.025	na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**21.8**	**11.9**	na	**1.36**	**1.48**	**1.18**	**1.55**	**1.16**	**1.32**	**1.51**	**1.53**	**1.15**
Dissolved Lead	0.015	**0.00387**	**0.00785**	na	**0.00138**	<0.001	<0.001	<0.001	<0.001	**0.00247**	<0.001	**0.00200**	**0.00252**
Dissolved Zinc	2	**124**	**71.4**	na	**9.36 J**	**7.97**	**1.86**	**7.3**	**4.58**	**5.63**	**7.18**	**6.00**	**6.00**
Total of Total Metals Concentrations		134.3287	82.40812	110.0249	10.40197	10.63	10.04	9.49124	6.00142	9.10295	9.41159	7.812	9.40388
Total of Dissolved Metals Concentrations		145.82727	83.30785		10.72138	9.45	3.04	8.85	5.74	6.95247	8.69	7.532	7.15252
Inorganics mg/L													
Nitrate	10 (NR)	<25	**1.8**	**1.6**	**25**	**24**	**18**	**16**	**21**	**27**	**29**	**16**	**29**
Sulfate	250 (NR)	**2100**	**1700**	**2100**	**510**	**480**	**490**	**520**	**700**	**500**	**480**	**380**	**440**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00042**	**0.0004**	**0.0014**	**0.00019**	**0.00033**	**0.000084**	**0.000072**	**0.00017**	**0.00018**	**0.00015**	**0.0001**	**0.00022**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00087**	**0.00078**	**0.0018**	**0.0013**	**0.002**	**0.0019**	**0.0033**	**0.002**	**0.0022**	**0.0018**	**0.0022**	**0.0022**
delta-BHC	0.00005(DL)	**0.00018**	**0.00027**	**0.0016**	**0.000082**	**0.00013**	<0.00005	<0.00005	**0.000088**	**0.000082**	**0.000066**	**0.00013**	**0.00011**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00041**	**0.00037**	**0.0012**	**0.000086**	**0.00017**	**0.00012**	**0.000087**	**0.000089**	**0.00014**	**0.00012**	**0.000091**	**0.00011**
gamma-Chlordane	0.002	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.000094	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.0047	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005
Total Pesticides		0.00188	0.00182	0.006	0.0017	0.003	0.002	0.00346	0.00235	0.003	0.002	0.003	0.003
pH (std units)		3.65	3.7	3.69	3.99	3.94	3.91	3.83	3.54	4.09	4.03	3.43	3.62
Specific Conductance (mS/cm)		3.0	2.69	2.58	0.911	1.1	0.8	1.23	1.12	1.09	0.944	1.23	1.28
Turbidity (NTUs)		110	26.5	5.21	33.2	4.2	0.37	3.5	7.6	0	7.4	4.2	5.6
DO (mg/L)		2.95	0.48		0.21	0.04	4.7	0.7	0.85	0	0	0.0	0.54
ORP (mV)		201	226		263	368	417	373	396	226	367	325	298

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-114**	**MW-114**	**MW-114**	**MW-114**	**MW-115**	**MW-115**	**MW-115**	**MW-115**	**MW-115**	**MW-115**	**MW-115**	**MW-115**
Sample Date	*Concentrations*	**11/14/2013**	**5/24/2013**	**11/15/2012**	**9/14/2010**	**5/10/2018**	**11/3/2017**	**5/5/2017**	**11/10/2016**	**6/7/2016**	**11/16/2015**	**6/1/2015**	**11/14/2014**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**1.80**	**1.93**	**1.6**	**2.2**	**3.47**	**3.4**	**4.4**	**5.3**	**4.17**	**3.51**	**5.11**	**4.3**
Total Lead	0.015	**0.00325**	<0.001	**0.00299**	**0.004**	**0.00175**	<0.001	<0.001	**0.0012**	**0.00393**	**0.00168**	**0.00205**	**0.00632**
Total Zinc	2	**9.04**	**9.74**	**8.66**	**8.7**	**8.36**	**9.31**	**12.5**	**14**	**14.4**	**8.47**	**11.4**	**18.6**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.01	na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**1.51**	**1.82**	**1.55**	na	**2.7**	**1.73**	**4.28**	**4.79**	**3.76**	**3.48**	**4.16**	**4.210**
Dissolved Lead	0.015	**0.00223**	<0.001	**0.00281**	na	**0.00157**	<0.001	<0.001	<0.001	**0.00139**	**0.0013**	**0.00145**	**0.00862**
Dissolved Zinc	2	**6.25**	**9.17**	**7.96**	na	**6.53**	**8.42**	**10.9**	**13.4**	**9.98**	**7.6**	**11.2**	**18.20**
Total of Total Metals Concentrations		10.84325	11.67	10.26299	10.904	11.83175	12.71	16.9	19.3012	18.57393	11.98168	16.51205	22.90632
Total of Dissolved Metals Concentrations		7.76223	10.99	9.51281		9.23157	10.15	15.18	18.19	13.74139	11.0813	15.36145	22.41862
Inorganics mg/L													
Nitrate	10 (NR)	**69**	**35**	**31**	**19**	**0.92**	**0.66**	**0.98**	<5.0	**3**	<12	**1.3**	**1.7**
Sulfate	250 (NR)	**850**	**450**	**460**	**290**	**620**	**590**	**650**	**720**	**860**	**690**	**780**	**650**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00023**	**0.00024**	**0.00018**	**0.00024**	**0.00025**	**0.00033**	**0.00033**	**0.00026**	**0.00015**	**0.00033**	**0.00028**	**0.00026**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0011**	**0.00064**	**0.00074**	**0.0046**	**0.00029**	**0.00038**	**0.00036**	**0.00027**	**0.00014**	**0.00037**	**0.00033**	**0.00026**
delta-BHC	0.00005(DL)	**0.000095**	<0.00005	**0.000077**	**0.00011 P**	<0.00005	<0.00005	<0.00005	**0.000051**	<0.00005	<0.00005	**0.000058**	**0.000073**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00012**	**0.00012**	**0.00012**	**0.00027**	<.00005	**0.000067**	**0.0001**	**0.000067**	<0.00005	**0.000076**	**0.000079**	**0.000076**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005
Total Pesticides		0.002	0.001	0.001117	0.00522	0.00054	0.00078	0.00079	0.00065	0.00029	0.00078	0.00075	0.00067
pH (std units)		3.92	4.04	4.08	4.05	3.95	3.79	3.7	3.69	3.47	3.68	3.69	3.30
Specific Conductance (mS/cm)		1.31	1.36	1.38	1.13	0.843	0.894	0.999	1.26	1.34	1.22	1.07	1.51
Turbidity (NTUs)		3.72	1.72	5.3	4.97	0	0.0	0.12	0.0	0.0	0.11	0	0.1
DO (mg/L)		0.43	0.87	0.65		0.27	0.03	5.44	0.6	2.13	3.59	0	0.0
ORP (mV)		269	352	244		3.58	353	463	431	411	4.5	412	422

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-115**	**MW-115**	**MW-115**	**MW-115**	**MW-115**	**MW-116**	**MW-116**	**MW-116**	**MW-116**	**MW-116**	**MW-116**	**MW-116**
Sample Date	*Concentrations*	**5/16/2014**	**11/13/2013**	**5/24/2013**	**11/15/2012**	**9/14/2010**	**5/14/2018**	**11/2/2017**	**5/4/2017**	**11/10/2016**	**6/3/2016**	**11/12/2015**	**5/28/2015**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**6.07**	**3.91**	**3.45**	**4.04**	**6.7**	**2.19**	**1.43**	**3.5**	**3.44**	**3.07**	**1.65**	**1.85**
Total Lead	0.015	**0.00116**	**0.0132**	**0.00124**	**0.00292**	<0.0015	<0.001	<0.001	**0.00352**	**0.00109**	**0.00195**	**0.00273**	**0.00187**
Total Zinc	2	**15.1**	**12.3**	**9.56**	**9.96**	**20**	**4.59**	**4.25**	**8.7**	**8.79**	**7.68**	**3.86**	**5.06**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.01	na	<0.005 UL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**4.22**	**2.78**	**3.37**	**3.57**	na	**1.72**	**1.5**	**3.47**	**3.22**	**2.94**	**1.68**	**1.88**
Dissolved Lead	0.015	<0.001	**0.0126**	**0.0011**	**0.00601**	na	<0.001 UL	<0.001	**0.00325**	<0.001	**0.00154**	**0.00255**	**0.00109**
Dissolved Zinc	2	**16.4**	**7.66**	**10.7**	**9.76**	na	**4.87**	**4.51**	**4.45**	**8.26**	**7.65**	**4.04**	**5.14**
Total of Total Metals Concentrations		21.17116	16.2232	13.01124	14.00292	26.7	6.78	5.68	12.20352	12.23109	10.75195	5.51273	6.91187
Total of Dissolved Metals Concentrations		20.62	10.4526	14.0711	13.33601		6.59	6.01	7.92325	11.48	10.59154	5.72255	7.02109
Inorganics mg/L													
Nitrate	10 (NR)	<5.0	<2.5	<2.5	**2.2**	**3.2**	**16**	**34**	**51**	**65**	**48**	**37**	**14**
Sulfate	250 (NR)	**880**	**720**	**580**	**730**	**430**	**510**	**430**	**560**	**510**	**700**	**430**	**500**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.00027**	**0.00016**	**0.00016**	**0.00028**	**0.00024**	<0.00005	<0.00005	<0.00005	**0.00015**	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00019**	**0.00018**	**0.00026**	**0.00026**	**0.00013**	**0.0002**	**0.00021**	**0.00035**	**0.00046**	**0.00038**	**0.00029**	**0.00031**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	**0.000074**	<0.000047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.000094	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.000078**	<0.00005	<0.00005	**0.000065**	**0.000073**	<0.00005	<0.00005	<0.00005	**0.00012**	**0.000054**	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.000047	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.000094	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.0047	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005
Total Pesticides		0.00054	0.00034	0.00042	0.00068	0.00044	0.00020	0.00021	0.00035	0.00073	0.00043	0.00029	0.00031
pH (std units)		3.7	3.63	3.75	3.71	3.76	4.08	4.09	4.00	4.04	3.82	4.43	4.25
Specific Conductance (mS/cm)		1.39	1.20	1.13	1.32	1.18	0.789	1.25	1.63	1.79	1.82	1.27	0.836
Turbidity (NTUs)		8.5	8.9	0	0	0.21	0.18	19.4	4.2	4.1	0.0	140	3.1
DO (mg/L)		1.72	0.58	1.06	0.38		2.04	1.63	2.86	1.16	1.24	64.5	1.38
ORP (mV)		236	290	409	389		241	306	286	356	324	220	347

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-116**	**MW-116**	**MW-116**	**MW-116**	**MW-116**	**MW-116**	**MW-117**	**MW-117**	**MW-117**	**MW-117**	**MW-117**	**MW-117**
Sample Date	*Concentrations*	**11/12/2014**	**5/16/2014**	**11/13/2013**	**5/23/2013**	**2012**	**7/28/2010 & 9/13/2010**	**5/10/2018**	**11/3/2017**	**5/5/2017**	**11/10/2016**	**6/3/2016**	**11/16/2015**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	Well was	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**2.54**	**2.45**	**3.25**	**1.91**	dry and	**4.1**	**0.03**	**0.0347**	**0.0289**	**0.0426**	**0.036**	**0.0321**
Total Lead	0.015	**0.00112**	**0.00386**	**0.00533**	**0.00162**	was not	**0.0073**	**0.00161**	<0.001	<0.001	**0.00131**	**0.00133**	**0.00175**
Total Zinc	2	**7.06**	**8.90**	**8.66**	**4.62**	sampled	**12**	**0.875**	**0.900**	**0.913**	**0.711**	**1.02**	**0.867**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005		na	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**3.25**	**2.15**	**2.65**	**1.47**		na	**0.0287**	**0.0259**	**0.0214**	**0.0337**	**0.0335**	**0.0272**
Dissolved Lead	0.015	**0.00102**	**0.00359**	**0.00409**	<0.001		na	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00112**
Dissolved Zinc	2	**8.85**	**6.53**	**6.25**	**3.56**		na	**0.791**	**0.830**	**0.684**	**0.663**	**1.01**	**0.682**
Total of Total Metals Concentrations		9.60112	11.35386	11.91533	6.53162		16.1073	0.90661	0.9347	0.9419	0.75491	1.05733	0.90085
Total of Dissolved Metals Concentrations		12.10102	8.68359	8.90409	5.03			0.8197	0.8559	0.7054	0.6967	1.0435	0.71032
Inorganics mg/L													
Nitrate	10 (NR)	**28**	**18**	**72**	**16**		**91**	**3.9**	**4.1**	**3.8**	**4.1**	**2.7**	**4.0**
Sulfate	250 (NR)	**430**	**660**	**570**	**400**		**710**	**140**	**120**	**140**	**140**	**180**	**140**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005		**0.00019**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005		<0.00048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.00055**	**0.00019**	**0.00025**	**0.00026**		**0.00063**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005		<0.000048	<0.00005	<0.00005	**0.00011**	<0.00005	<0.00005	<0.00005
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001		<0.000095	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005		**0.00027**	<0.00005	<0.00005	**0.000057**	<0.00005	<0.00005	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005		na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005		<0.000048	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005		<0.000095	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005		<0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.005
Total Pesticides		0.00055	0.00019	0.00025	0.00026		0.00109	BDL	BDL	0.00017	BDL	BDL	BDL
pH (std units)		4.05	4.06	3.55	4.24	DRY	3.92/3.94	4.7	4.23	4.07	4.1	3.44	4.27
Specific Conductance (mS/cm)		0.999	1.48	0.652	1.17		2.06/2.3	0.267	0.327	0.317	0.401	0.372	0.364
Turbidity (NTUs)		7.1	2.1	148	9.16		3.75/4.95	7.09	4.8	5.5	84.3	9.2	6.5
DO (mg/L)		0	3.87	1.42	6.1			1.57	0.55	2.14	1.38	0.50	3.39
ORP (mV)		393	300	332	249			274	369	491	421	310	436

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-117**	**MW-117**	**MW-117**	**MW-117**	**MW-117**	**MW-117**	**MW-117**	**MW-119**	**MW-119**	**MW-119**	**MW-119**	**MW-119**
Sample Date	*Concentrations*	**6/2/2015**	**11/17/2014**	**5/19/2014**	**11/15/2013**	**5/23/2013**	**11/15/2012**	**9/14/2010**	**5/15/2018**	**11/7/2017**	**5/9/2017**	**11/11/2016**	**6/8/2016**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0025	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0295**	**0.0678**	**0.0362**	**0.0438**	**0.0318**	**0.0453**	**0.038**	**0.00421 JB**	**0.00472**	**0.0986**	**0.0737**	**0.018**
Total Lead	0.015	**0.00117**	**0.00282**	**0.00109**	**0.00172**	**0.00107**	**0.00193**	<0.0015	<0.001	<0.001	**0.00115**	<0.001	**0.0045**
Total Zinc	2	**0.802**	**1.01**	**0.809**	**1.01**	**1.05**	**0.794**	**1.6**	**0.647**	**0.605**	**1.23**	**1.45**	**2.3**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	na	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.0321**	**0.0761**	**0.0378**	**0.033**	**0.0272**	**0.0410**	na	**0.00216 JB**	<0.002	**0.137**	<0.002	**0.00895**
Dissolved Lead	0.015	<0.001	**0.00178**	<0.001	<0.001	<0.001	**0.00115**	na	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**0.865**	**0.991**	**0.95**	**0.878**	**0.879**	**0.775**	na	**0.483**	**0.604**	**1.1**	**1.27**	**2.02**
Total of Total Metals Concentrations		0.83267	1.08062	0.84629	1.05552	1.08287	0.84123	1.638	0.65121	0.60972	1.32975	1.5237	2.3225
Total of Dissolved Metals Concentrations		0.8971	1.06888	0.9878	0.911	0.9062	0.81715		0.48516	0.604	1.237	1.27	2.02895
Inorganics mg/L													
Nitrate	10 (NR)	**3.4**	**3.1**	**3.3**	**3.9**	**4.0**	**3.8**	**2.5**	<0.25	<0.25	<0.25	**0.33**	<2.5
Sulfate	250 (NR)	**150**	**130**	**140**	**140**	**140**	**130**	**260**	**59**	**66**	**150**	**140**	**150**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00045**	**0.0006**	**0.00071**	**0.0012**	**0.0015**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.00034**	**0.00058**	**0.00073**	**0.0009**	**0.0011**
delta-BHC	0.00005(DL)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000056**	<0.00005	**0.00038**	<0.001	**0.00076**	**0.001**	**0.0014**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	**0.000053**	**0.00011**	**0.00012**	**0.00017**	**0.00086**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	na	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003
Total Pesticides		BDL	BDL	BDL	BDL	BDL	0.000056	BDL	0.00122	0.00129	0.00232	0.00327	0.00486
pH (std units)		4.41	3.52	4.21	4.17	4.23	4.18	4.24	6.82	6.42	6.04	6.91	6.29
Specific Conductance (mS/cm)		0.305	0.414	0.408	0.416	0.419	0.396	0.51	0.431	0.485	0.505	1.690	0.513
Turbidity (NTUs)		8.1	1.3	7.2	8.78	9.79	10.41	8.19	5.01	5.09	0.6	0.0	7.4
DO (mg/L)		1.2	1.40	2.95	1.43	1.42	6.8		0.23	0.0	0.47	0.65	0.13
ORP (mV)		382	421	382	353	364	398		-10	-31	65	19	39

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-119**	**MW-119**	**MW-119**	**MW-119**	**MW-119**	**MW-119**	**MW-119**	**MW-120**	**MW-120**	**MW-120**	**MW-120**	**MW-120**
Sample Date	*Concentrations*	**11/17/2015**	**6/5/2015**	**11/18/2014**	**5/21/2014**	**11/18/2013**	**5/28/2013**	**12/6/2012**	**5/16/2018**	**11/7/2017**	**5/9/2017**	**11/11/2016**	**6/8/2016**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.00727**	**0.0106**	**0.00514**	**0.00386**	**0.00391**	**0.0158**	<0.005	**0.00857 JB**	**0.0425**	**0.059**	**0.0222**	**0.00986**
Total Lead	0.015	<0.001	<0.001	<0.001	**0.00183**	**0.00276**	**0.0059**	**0.0012**	**0.00101**	**0.00121**	**0.00102**	**0.00124**	**0.00247**
Total Zinc	2	**1.05**	**0.76**	**0.677**	**1.38**	**0.778**	**1.18**	**0.656**	**0.637**	**0.846**	**0.809**	**0.813**	**0.813**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.0225**	<0.002	**0.00369**	<0.002	**0.00530**	**0.00697**	<0.002	**0.00629 JB**	**0.0113**	**0.0162**	**0.00577**	**0.00594**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**1.09**	**0.69**	**0.689**	**1.36**	**0.677**	**0.877**	**0.532**	**0.614**	**0.762**	**0.735**	**0.804**	**0.74**
Total of Total Metals Concentrations		1.05727	0.7706	0.68214	1.38569	0.78467	1.2017	0.6572	0.64658	0.88971	0.86902	0.83644	0.82533
Total of Dissolved Metals Concentrations		1.1125	0.69	0.69269	1.36	0.6823	0.88397	0.532	0.62029	0.7733	0.7512	0.80977	0.74594
Inorganics mg/L													
Nitrate	10 (NR)	<2.5	<0.25	<0.25	<0.25	<0.25	<1.2	<0.25	<0.25	**0.56**	<0.25	<2.5	<2.5
Sulfate	250 (NR)	**140**	**92**	**170**	**120**	**94**	**110**	**150**	**220**	**240**	**200**	**210**	**190**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00018**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0012**	**0.00049**	**0.00064**	**0.00140**	**0.00050**	**0.00060**	**0.00087**	**0.0013**	**0.0014**	**0.0016**	**0.0013**	**0.0014**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0011**	**0.00052**	**0.00062**	**0.0011**	**0.00042**	**0.00051**	**0.00066**	**0.0015**	**0.002**	**0.0017**	**0.0012**	**0.0013**
delta-BHC	0.00005(DL)	**0.0011**	**0.00053**	**0.001**	**0.0016**	**0.00051**	**0.00053**	**0.00073**	**0.0012**	**0.0014**	**0.0014**	**0.0011**	**0.0012**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00023**	**0.000085**	**0.00013**	**0.00025**	**0.0001**	**0.00012**	**0.00013**	**0.00016**	**0.00021**	**0.00016**	**0.000065**	**0.00015**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003
Total Pesticides		0.00363	0.001625	0.002390	0.004350	0.001530	0.00176	0.00257	0.00416	0.00501	0.00486	0.00367	0.00405
pH (std units)		6.92	7.01	5.64	5.44	6.25	5.75	5.99	6.03	5.92	5.8	6.79	6.06
Specific Conductance (mS/cm)		0.547	0.474	0.740	0.719	0.731	0.647	0.646	0.549	0.610	0.575	1.78	0.512
Turbidity (NTUs)		8.6	5.3	6.8	6.1	7.4	107	3.1	1.19	6.94	1.7	3.6	3.4
DO (mg/L)		0	0	7.45	0.52	0.43	4.78	0.6	0.76	0.0	0.48	1.1	0.0
ORP (mV)		14	3	-21	44	-59	49	40.4	128	99	157	113	98

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-120**	**MW-120**	**MW-120**	**MW-120**	**MW-120**	**MW-120**	**MW-120**	**MW-121**	**MW-121**	**MW-121**	**MW-121**	**MW-121**
Sample Date	*Concentrations*	**11/17/2015**	**6/4/2015**	**11/19/2014**	**5/21/2014**	**11/18/2013**	**5/28/2013**	**12/7/2012**	**5/11/2018**	**11/7/2017**	**5/10/2017**	**11/11/2016**	**6/7/2016**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	**0.00117 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0422**	**0.0063**	**0.0108**	**0.0584**	**0.0124**	**0.0129**	**0.0289**	**0.00877 JB**	**0.0120**	**0.00524**	**0.0491**	**0.0105**
Total Lead	0.015	**0.00541**	<0.001	**0.00197**	**0.04600**	**0.0018**	**0.00418**	**0.0295**	<0.001	<0.001	<0.001	**0.00346**	**0.00117**
Total Zinc	2	**1.33**	**0.533**	**0.690**	**1.41**	**1.23**	**0.894**	**1.88**	**0.0259 JB**	**0.0331**	**0.0218**	**1.14**	**0.0373**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.000536	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.101**	**0.00268**	**0.0042**	**0.0029**	**0.00554**	**0.0067**	**0.00223**	<0.01	**0.00918**	**0.0038**	**0.0278**	**0.00693**
Dissolved Lead	0.015	<0.001	<0.001	<0.0000990	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**1.31**	**0.458**	**0.667**	**1.18**	**1.07**	**0.737**	**1.74**	<0.05	**0.0334**	<0.0100	**1.08**	**0.0178**
Total of Total Metals Concentrations		1.37761	0.5393	0.70277	1.5144	1.2442	0.91108	1.9384	0.03467	0.0451	0.02704	1.19256	0.04897
Total of Dissolved Metals Concentrations		1.411	0.46068	0.6712	1.1829	1.07554	0.7437	1.74223	BDL	0.04258	0.0038	1.1078	0.02473
Inorganics mg/L													
Nitrate	10 (NR)	<2.5	<0.25	<0.14	<0.25	<1.2	<1.2	<0.25	**0.95**	**0.90**	**2.4**	**0.46**	**2.8**
Sulfate	250 (NR)	**330**	**170**	**170**	**150**	**150**	**160**	**410**	**46**	**60**	**45**	**260**	**46**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.0017**	**0.0012**	**0.00096**	**0.00095**	**0.00090**	**0.00063**	**0.0035**	**0.00014**	**0.00023**	**0.000083**	**0.005**	**0.00011**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0019**	**0.0013**	**0.0011**	**0.00099**	**0.00089**	**0.00075**	**0.0042**	**0.00010**	**0.00030**	**0.00011**	**0.0019**	**0.000059**
delta-BHC	0.00005(DL)	**0.0015**	**0.0011**	**0.001**	**0.0014**	**0.00071**	**0.00046**	**0.0031**	**0.00011**	<0.00005	**0.000065**	**0.0063**	**0.000071**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.00017**	<0.00005	<0.00005	**0.000084**	<0.00005	<0.00005	**0.0011**	<0.00005	**0.00013**	<0.00005	**0.0029**	<0.00005
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003
Total Pesticides		0.00527	0.00360	0.00306	0.00342	0.00250	0.0018	0.0119	0.00035	0.0007	0.0003	0.01610	0.00024
pH (std units)		5.92	6.57	5.59	5.61	5.57	5.38	6.3	6.49	6.22	6.22	5.72	6.36
Specific Conductance (mS/cm)		0.723	0.563	0.85	0.693	0.640	0.645	0.95	0.247	0.33	0.327	0.827	0.271
Turbidity (NTUs)		84.6	763	82	279	8.3	78.9	76.1	113	0	0	0.0	7.5
DO (mg/L)		0	0.31	6.05	0.53	8.93	3.06	6.42	4.58	0.23	1.72	3.34	0.61
ORP (mV)		97	146	82	93	85	175	58.6	144	127	127	172	142

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**MW-121**	**MW-121**	**MW-121**	**MW-121**	**MW-121**	**MW-121**	**MW-121**	**OW-1**	**OW-1**	**OW-1**	**OW-1**	**OW-1**
Sample Date	*Concentrations*	**11/13/2015**	**6/5/2015**	**11/13/2014**	**5/19/2014**	**11/18/2013**	**5/29/2013**	**12/6/2012**	**5/14/2018**	**11/8/2017**	**5/10/2017**	**11/11/2016**	**6/8/2016**
Metals mg/L													
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.126**	**0.139**	**0.0683**	**0.0952**	**0.187**
Total Copper	1.3	**0.0052**	**0.0309**	**0.0113**	**0.00695**	**0.00330**	**0.00429**	**0.0295**	<0.2	**0.170**	**0.314**	**0.486**	**0.164**
Total Lead	0.015	<0.001	<0.001	<0.001	**0.00136**	<0.001	<0.001	**0.0012**	<0.001	<0.001	<0.001	**0.00103**	<0.001
Total Zinc	2	**0.0187**	**0.0204**	**0.0434**	**0.0194**	**0.0112**	**0.0313**	**1.59**	**3.52**	**4.62**	**8.01**	**14.8**	**4.69**
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0315**	**0.0416**	**0.0229**	**0.026**	**0.0142**
Dissolved Copper	1.3	**0.00345**	**0.0066**	**0.00286**	**0.00223**	**0.00469**	**0.0106**	**0.0112**	**0.0498**	**0.0760**	**0.149**	**0.162**	**0.0498**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	<0.01	**0.0163**	**0.0196**	**0.0125**	**0.0692**	**0.0153**	**1.25**	**3.42**	**4.8**	**2.23**	**12.6**	**4.57**
Total of Total Metals Concentrations		0.0239	0.0513	0.0547	0.02771	0.0145	0.03559	1.6207	3.646	4.929	8.3923	15.38223	5.041
Total of Dissolved Metals Concentrations		0.00345	0.0229	0.02246	0.01473	0.07389	0.0259	1.2612	3.5013	4.9176	2.4019	12.788	4.634
Inorganics mg/L													
Nitrate	10 (NR)	**5.0**	<0.25	**0.43**	**0.4**	**0.45**	**0.32**	**0.59**	<0.25	<0.25	<0.25	<2.5	<2.5
Sulfate	250 (NR)	**21**	**12**	**50**	**42**	**64**	**56**	**220**	**290**	**370**	**390**	**240**	**550**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00018**	**0.00015**	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	<0.00005	<0.00005	**0.000054**	**0.00012**	**0.00030**	**0.00018**	**0.0027**	**0.00081**	**0.016**	**0.012**	**0.014**	**0.0067**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	<0.00005	**0.000054**	**0.0001**	**0.00012**	**0.00023**	**0.00015**	**0.0011**	**0.00035**	<0.005	**0.0046**	**0.0039**	**0.0029**
delta-BHC	0.00005(DL)	<0.00005	**0.000071**	<0.000050	**0.00011**	**0.00023**	**0.000078**	**0.0023**	**0.015**	**0.019**	**0.02**	**0.018**	**0.014**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	**0.00009**	<0.00005	**0.0014**	**0.0006**	**0.0056**	**0.0082**	**0.0069**	**0.0067**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003
Total Pesticides		BDL	0.0001	0.0002	0.0004	0.0009	0.000408	0.0075	0.01676	0.04078	0.04495	0.04280	0.03030
pH (std units)		6.24	6.35	6.36	6.03	6.10	5.85	5.97	5.85	6.08	5.92	5.73	5.88
Specific Conductance (mS/cm)		0.286	0.292	0.251	0.369	0.425	0.395	0.633	0.723	0.866	0.824	1.26	0.92
Turbidity (NTUs)		0.1	0	1.8	0	1.45	0.47	3.6	0	0.0	0	0.0	0.0
DO (mg/L)		2.95	0	0	0.71	0.74	2.18	3.9	0.57	0.0	0.42	0.2	0.0
ORP (mV)		157	149	43	167	82	154	79.6	-10	13	79	44	10

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**OW-1**	**OW-1**	**OW-1**	**OW-1**	**OW-1**	**OW-1**	**OW-1**	**OW-1**	**OW-2**	**OW-2**	**OW-2**	**OW-2**
Sample Date	*Concentrations*	**11/16/2015**	**6/3/2015**	**5/19/2014**	**1/8/2014**	**10/9/2013**	**7/16/2013**	**4/15/2013**	**1/20/2013**	**5/15/2018**	**11/8/2017**	**5/10/2017**	**11/14/2016**
Metals mg/L													
Total Arsenic	0.01	**0.0644**	**0.0801**	**0.102**	**0.0493**	**0.0375**	**0.0636**	**0.0671**	**0.0918**	**0.0501**	**0.0641**	**0.0492**	**0.0431**
Total Copper	1.3	**0.483**	**0.25**	**0.181**	**0.471**	**0.417**	**0.33**	**0.293**	**0.0929**	**0.0441**	**0.0290**	**0.0503**	<0.1
Total Lead	0.015	**0.00101**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00106**	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**9.54**	**5.75**	**7.71**	**17.2**	**14.6**	**11.2**	**15.8**	**5.55**	**3.79**	**2.63**	**2.56**	**3.87**
Dissolved Arsenic	0.01	**0.0214**	**0.0226**	**0.0228**	**0.0281**	**0.0121**	**0.0188**	**0.0131**	**0.0709**	**0.0123**	**0.0373**	**0.0212**	**0.0339**
Dissolved Copper	1.3	**0.22**	**0.0869**	**0.0724**	**0.345**	**0.23**	**0.129**	**0.0855**	**0.0716**	**0.0204 JB**	**0.0592**	**0.021**	**0.0493**
Dissolved Lead	0.015	**0.00106**	**0.00135**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**7.49**	**5.9**	**5.62**	**14.9**	**16.7**	**10.7**	**14.3**	**5.75**	**2.95**	**2.93**	**0.788**	**3.78**
Total of Total Metals Concentrations		10.088	6.080	7.993	17.720	15.055	11.594	16.160	5.736	3.8842	2.7231	2.6595	3.9131
Total of Dissolved Metals Concentrations		7.732	6.011	5.715	15.273	16.942	10.848	14.399	5.893	2.9827	3.0265	0.8302	3.8632
Inorganics mg/L													
Nitrate	10 (NR)	<5	<0.25	<0.25	<2.5	<5.0	<2.5	<2.5	<2.5	<0.25	<0.25	<0.25	<2.5
Sulfate	250 (NR)	**530**	**350**	**450**	**600**	**580**	**590**	**800**	**600**	**490**	**480**	**450**	**630**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	**0.00019**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.00023**	<0.001	<0.0001	<0.0001	<0.0001	<0.002
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	**0.0001**	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.002
alpha-BHC	0.00005(DL)	**0.0067**	**0.0066**	**0.0086**	**0.0077**	**0.0097**	**0.0088**	**0.0098**	**0.012**	**0.027**	**0.036**	**0.015**	**0.052**
alpha-Chlordane	0.002	<0.000050	<0.000050	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.00005	<0.00005	<0.00005	<0.001
beta-BHC	0.00005(DL)	**0.0034**	**0.0033**	**0.0034**	**0.0039**	**0.0037**	**0.004**	**0.0036**	**0.004**	**0.0054**	**0.0068**	**0.0042**	**0.0086**
delta-BHC	0.00005(DL)	**0.013**	**0.013**	**0.017**	**0.013**	**0.017**	**0.016**	**0.016**	**0.017**	**0.072**	**0.13**	**0.059**	**0.18**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.002
gamma-BHC	0.0002	**0.0059**	**0.0058**	**0.0067**	**0.0075**	**0.013**	**0.0086**	**0.0077**	**0.0083**	**0.018**	**0.047**	**0.0095**	**0.056**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.001
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.001
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.01
Toxaphene	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003
Total Pesticides		0.0292	0.0287	0.0357	0.0322	0.0434	0.0374	0.0373	0.0413	0.12240	0.21980	0.08770	0.29660
pH (std units)		6.64	5.27	5.92	5.92	5.71	5.95	6.08	5.77	5.71	5.98	6.01	6.05
Specific Conductance (mS/cm)		1.19	0.743	1.23	1.233	1.404	1.323	1.753	1.40	1.35	1.21	0.88	1.28
Turbidity (NTUs)		1.2	0	0	2.57	6.35	75.6	6.9	4.3	0	5.86	6.1	0.0
DO (mg/L)		0	0.67	1.75	0.76	0.92	0.43	5.05	1.1	0.7	0.0	0.32	0.0
ORP (mV)		54	108	71.0	55.0	155.3	45.5	55.9	100.2	-3	1	38	-5

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**OW-2**	**OW-2**	**OW-2**	**OW-2**	**OW-2**	**OW-2**	**OW-2**	**OW-2**	**OW-2**	**OW-3**	**OW-3**	**OW-3**
Sample Date	*Concentrations*	**6/8/2016**	**11/13/2015**	**6/3/2015**	**5/20/2014**	**1/8/2014**	**10/9/2013**	**7/16/2013**	**4/16/2013**	**1/20/2013**	**5/15/2018**	**11/8/2017**	**5/10/2017**
Metals mg/L													
Total Arsenic	0.01	**0.0382**	**0.0532**	**0.0321**	**0.057**	**0.0392**	**0.029**	**0.031**	**0.0314**	**0.0258**	<0.005	<0.005	<0.005
Total Copper	1.3	**0.0478**	**0.0476**	**0.0645**	**0.0512**	**0.0439**	**0.0338**	**0.0252**	**0.0159**	**0.0281**	**0.572**	**0.485**	**0.468**
Total Lead	0.015	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Zinc	2	**3.57**	**2.89**	**5.09**	**5.4**	**8.35**	**6.13**	**6.33**	**4.89**	**2.33**	**5.01**	**3.90**	**3.75**
Dissolved Arsenic	0.01	<0.005	**0.0272**	**0.00919**	**0.0163**	**0.0252**	**0.015**	**0.0168**	**0.0278**	**0.0243**	<0.005	<0.005	<0.005
Dissolved Copper	1.3	**0.0251**	**0.0215**	**0.0291**	**0.0314**	**0.0263**	**0.0222**	**0.018**	**0.00567**	**0.0236**	**0.486**	**0.561**	**0.457**
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc	2	**3.42**	**2.66**	**4.52**	**5.32**	**6.31**	**5.80**	**5.95**	**4.83**	**2.24**	**4.12**	**4.24**	**1.21**
Total of Total Metals Concentrations		3.656	2.991	5.187	5.508	8.433	6.193	6.386	4.937	2.384	5.582	4.385	4.218
Total of Dissolved Metals Concentrations		3.4451	2.709	4.558	5.368	6.362	5.837	5.985	4.863	2.288	4.606	4.801	1.667
Inorganics mg/L													
Nitrate	10 (NR)	<2.5	<2.5	<0.25	<0.14	<2.5	<5.0	<2.5	<2.5	<0.25	**0.58**	**0.36**	< 2.5
Sulfate	250 (NR)	**590**	**480**	**620**	**710**	**640**	**520**	**530**	**480**	**350**	**480**	**890**	**500**
Organochlorine Pesticides mg/L													
4,4´-DDD	0.0001	**0.00012**	**0.00015**	**0.00018**	**0.00012**	**0.00019**	**0.00019**	<0.0001	**0.00039**	<0.002	<0.0001	<0.0001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	**0.00019**	**0.00021**	**0.000088**	**0.00027**	**0.00015**	<0.0001	**0.00035**	<0.001	<0.0001	<0.0001	<0.0001
alpha-BHC	0.00005(DL)	**0.022**	**0.042**	**0.022**	**0.062**	**0.024**	**0.031**	**0.015**	**0.0096**	**0.011**	**0.0038**	<0.005	**0.0037**
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
beta-BHC	0.00005(DL)	**0.0051**	**0.0083**	**0.0052**	**0.011**	**0.011**	**0.007**	**0.0046**	**0.0041**	**0.0043**	**0.0020**	<0.005	**0.0018**
delta-BHC	0.00005(DL)	**0.081**	**0.15**	**0.063**	**0.16**	**0.084**	**0.08**	**0.028**	**0.019**	**0.022**	**0.0097**	**0.0094**	**0.0096**
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-BHC	0.0002	**0.018**	**0.045**	**0.016**	**0.066**	**0.031**	**0.033**	**0.01**	**0.0063**	**0.0038**	**0.002**	<0.005	**0.0021**
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toxaphene	0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003
Total Pesticides		0.12622	0.2456	0.1066	0.29921	0.15046	0.15134	0.05760	0.03974	0.0411	0.01750	0.00940	0.01720
pH (std units)		5.78	6.76	5.97	5.86	5.75	5.49	5.67	5.78	5.6	4.92	5.09	5.19
Specific Conductance (mS/cm)		0.96	1.14	1.2	1.66	1.251	1.337	1.251	1.08	0.908	0.802	0.639	0.9
Turbidity (NTUs)		0.0	82.1	10.2	6.8	1.16	3.12	14.1	7.1	34	0	0	2.6
DO (mg/L)		0.0	0	0.63	2.01	0.64	0.76	0.37	0.61	1.02	0.7	0.0	0.5
ORP (mV)		25	46	43	60.0	42.8	81.5	98.9	58.1	37.2	157	235	268

TABLE 3: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well Number	*Type 1 RRS*	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**OW-3**	**MW-WO-01**
Sample Date	*Concentrations*	**11/14/2016**	**6/8/2016**	**11/13/2015**	**6/8/2015**	**5/21/2014**	**1/8/2014**	**10/9/2013**	**7/16/2013**	**4/16/2013**	**1/20/2013**	**3/15/2016**
Metals mg/L												
Total Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
Total Copper	1.3	**0.579**	**1.25**	**0.726**	**0.984**	**1.32**	**1.09**	**0.918**	**0.954**	**1.08**	**0.126**	NA
Total Lead	0.015	<0.001	<0.001	**0.00219**	**0.00179**	**0.00157**	<0.001	<0.001	<0.001	<0.001	<0.001	NA
Total Zinc	2	**5.22**	**8.49**	**4.81**	**9.05**	**15.7**	**12**	**7.81**	**7.42**	**9.3**	**5.44**	NA
Dissolved Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NA
Dissolved Copper	1.3	**0.559**	**1.23**	**0.692**	**0.807**	**1.71**	**1.09**	**0.906**	**0.962**	**1.04**	**0.115**	NA
Dissolved Lead	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NA
Dissolved Zinc	2	**5.31**	**8.48**	**4.92**	**7.22**	**19.1**	**8.9**	**7.83**	**7.13**	**9.26**	**5.22**	NA
Total of Total Metals Concentrations		5.799	9.74	5.538	10.036	17.022	13.090	8.728	8.374	10.380	5.566	
Total of Dissolved Metals Concentrations		5.869	9.71	5.612	8.027	20.810	9.990	8.736	8.092	10.300	5.335	
Inorganics mg/L												
Nitrate	10 (NR)	<2.5	**4**	<2.5	**0.52**	**8.1**	**1.8**	<2.5	<1.2	<2.5	**0.98**	NA
Sulfate	250 (NR)	**560**	**1100**	**560**	**420**	**700**	**460**	**500**	**450**	**540**	**390**	NA
Organochlorine Pesticides mg/L												
4,4´-DDD	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.001	<0.001	<0.0001	<0.001	<0.0001
4,4´-DDE	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.0001
4,4´-DDT	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.001	<0.001	**0.0001**	<0.001	<0.0001
alpha-BHC	0.00005(DL)	**0.0041**	**0.0015**	**0.0036**	**0.0032**	**0.0026**	**0.0027**	**0.0028**	**0.0035**	**0.0023**	**0.0047**	<0.0001
alpha-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005
beta-BHC	0.00005(DL)	**0.0022**	**0.0019**	**0.0021**	**0.0018**	**0.0013**	**0.0016**	**0.0013**	**0.0019**	**0.0012**	**0.0024**	<0.0001
delta-BHC	0.00005(DL)	**0.0093**	**0.0044**	**0.01**	**0.0083**	**0.0064**	<0.00005	**0.0089**	**0.0079**	**0.0057**	**0.0067**	<0.0001
Dieldrin	0.0001(DL)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.001	<0.0001
gamma-BHC	0.0002	**0.002**	**0.0012**	**0.002**	**0.0021**	**0.0018**	**0.002**	**0.0038**	**0.0025**	**0.0021**	**0.0021**	<0.0001
gamma-Chlordane	0.002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005	NA
Heptachlor	0.0004	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005	<0.0001
Methoxychlor	0.04	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0003
Toxaphene	0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.002
Total Pesticides		0.01760	0.00900	0.0177	0.0154	0.0121	0.0063	0.0168	0.0158	0.0114	0.0159	BDL
pH (std units)		5.05	4.77	5.17	4.95	4.53	4.51	4.32	4.65	4.82	5.06	
Specific Conductance (mS/cm)		1.11	1.74	0.985	0.788	1.58	0.855	0.992	0.922	1.076	0.93	
Turbidity (NTUs)		0.0	0.0	102	4.6	0	0.47	0.58	2.8	8.1	48	
DO (mg/L)		0.8	0.0	0	0	1.2	0.47	0.76	0.39	0.58	0.66	
ORP (mV)		253	161	274	297	260	168.3	208.7	202.6	204.2	128.5	

Notes:

<0.00005 = constituent not detected above laboratory quantitation limit
BDL = Below Detection Limit (below laboratory quantitation limit)
NA = not analyzed
Bolded concentrations indicate detection above laboratory quantitation limit
[ ] Concentration above the Type 1 RRS
NR = not regulated under HSRA or VRP
DL = Detection limit
mg/L = milligrams per liter
P = Identification of target analytes using gas chromatography (GC) is based on retention time. Although 2 dissimilar GC columns confirmed the presence of the target analyte in the sample, relative percent difference is >40%.
J = Estimated, based on QC criteria
JB = Estimated, based on blank contamination
JH = Estimated, possibly biased high
JL = Estimated, possibly biased low
UJ = Not Detected, estimated based on QC criteria
UL = Not Detected, estimated possibly biased low

Prepared by:RNQ 7/6/2018
Checked by: AS 7/7/2018

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW-2010-5		SW-2010-5	SW-2010-5	SW-2010-5	SW-2010-5	SW-2010-5	SW-2010-5	SW2010-5	SW2010-5	SW2010-5	SW2010-5	SW2010-5
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014	11/19/2013	5/30/2013	11/16/2012	9/23/2010
						Distance Along Stream (ft)	735		735	735	735	735	735	735	735	735	735	735	735	735
Total Organochlorine Pesticides (ug/L)							Surface water sample from main channel upstream of culvert													
	Ecological Exposure		**Human Health Exposure**																	
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.052**		**0.022J**	**0.087**	**0.2**	**0.074**	**0.059**	**0.062**	**0.083**	**0.075**	**0.085**	**0.092**	**0.11**	0.13
beta-BHC	not established		0.0091	0.017	0.017		**0.033**	**JQ**	**0.048J**	**0.078**	**0.083**	**0.085**	**0.064**	**0.21**	**0.074**	**0.12**	**0.073**	**0.089**	**0.071**	0.23
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.035**	**JQ**	<0.017	<0.05	**0.021 J**	**0.023 J**	**0.013 J**	**0.013 J**	**0.0092 J**	**0.014 J**	<0.050	**0.0087 J**	<0.05	0.037 P
delta-BHC	not established			not established			**0.024**	**JQ**	<0.014	**0.034 J**	**0.041 J**	**0.033 J**	**0.024 J**	**0.091**	<0.0031	**0.014**	**0.051**	**0.078**	**0.12**	0.2
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022	<0.050	<0.0066	<0.05	<0.1
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	<0.05	<0.0047	<0.00005	<0.005	<0.005	<0.050	<0.0047	<0.05	NA
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	<0.1	**0.0056 J**	<0.0082	<0.0001	<0.0091	<0.0091	<0.10	<0.014	<0.1	<0.0065
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006	<0.10	<0.0075	<0.1	<0.0077
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.07		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069	<0.10	<0.014	<0.1	<0.0097
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		<0.005		<0.017	<0.1	**0.0085 J**	**0.0041 J**	<0.0072	<0.0001	<0.0091	<0.0091	<0.10	<0.013	<0.1	<0.0091
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072	<0.050	<0.0038	<0.05	<0.007
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043	<0.50	<0.08	<0.5	<0.013
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3.0	<3	<0.18	<0.005	<0.16	<0.16	<5.0	<0.085	<5	<0.5
Total Pesticides Concentrations (ug/L)							0.144		0.07	0.199	0.3535	0.2247	0.16	0.376	0.1662	0.223	0.209	0.2677	0.301	--
Total Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	0.008
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0161**	0.016
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.001	0.00067 J
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.16**	0.97
Dissolved Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		**0.004**	**JQ**	**0.00611**	**0.00161 J**	**0.00148 J**	**0.00136 J**	**0.00212 J**	**0.00228 J**	**0.000704 J**	**0.00175 J**	<0.005	**0.00156 J**	<0.005	0.0015 J
Copper	0.0152*	0.0152*	1.3	not established			**0.00966**		**0.00888**	**0.0084**	**0.00706**	**0.00536**	**0.0063**	**0.00517**	**0.00471**	**0.00684**	**0.101**	**0.007**	**0.00365**	0.0074
Lead	0.0049*	0.0049*		not established			<0.000621		<0.000215	<0.001	<0.001	<0.001	<0.000309	<0.001	<0.000099	<0.0001	<0.001	<0.00014	<0.001	<0.0002
Zinc	0.200*	0.200*	7.4	26	not established		**0.307**		**0.189**	**0.578**	**0.789**	**0.504**	**0.381**	**0.444**	**0.469**	**0.434**	**0.840**	**0.706**	**1.03**	0.89
Total Dissolved Metals Concentrations (mg/L)							0.32066		0.2056	0.58801	0.79754	0.51072	0.38942	0.45145	0.474414	0.44259	0.941	0.71456	1.03365	--
Total Trichlorobenzenes (ug/L)																				
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.97
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.54
Nitrate and Sulfate (mg/L)																				
Nitrate as N	not established		10 (nitrates)		not established		**1.0**		**0.54**	**1.0**	**0.9 J**	**1.9 J**	**1.4 J**	**1.2**	**1.8**	**1.7**	**0.72**	**1.3**	**0.55**	0.74
Sulfate	not established			not established			**62**		**39**	**84**	**97**	**97**	**97**	**78**	**100**	**85**	**83**	**93**	**87**	110
Hardness as CaCo3 (mg/L)	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (std units)							7.05		6.91	6.21	6.52	7.04	7.31	7.44	6.96	7.35	5.62	6.61		
Specific Conductance (mS/cm)							0.329		0.237	0.424	0.462	0.509	0.545	0.423	0.443	0.501	0.683	0.812		
Turbidity (NTUs)							0.0		6.8	1.2	0.0	0	23.1	0	5.88	0	0	0		
DO (mg/L)							5.99		7.13	6.61	5.34	6.38	6.2	3.64	10.65	8.03	7.33	9.68		
ORP (mV)							69		40	143	169	37	65	47	27	57	127	51		

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2010-10		SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10	SW2010-10
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014	11/19/2013	5/30/2013	11/16/2012	9/23/2010
						Distance Along Stream (ft)	1152		1152	1152	1152	1152	1152	1152	1152	1152	1152	1152	1152	1152
Total Organochlorine Pesticides (ug/L)							Surface water sample from main channel upstream of culvert													
	Ecological Exposure			**Human Health Exposure**																
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.12**	**JH**	**0.05**	0.23	0.23	0.22	0.15	0.11	0.097	0.12	0.17	0.18	0.15	0.13
beta-BHC	not established		0.0091	0.017	0.017		<0.004		**0.047J**	0.12	0.099	0.12	0.082	0.24	0.081	0.12	0.092	0.13	0.092	0.18
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.074**	**JH**	**0.028J**	0.11	0.075	0.1	0.063	0.054	0.028 J	0.046 J	0.060	0.066	<0.05	0.084
delta-BHC	not established			not established			**0.16**	**JH**	**0.044J**	0.11	0.11	0.12	0.066	0.14	0.059	0.16	0.077	0.16	0.14	0.11 P
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022	<0.050	<0.0066	<0.05	<0.094
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	**0.011 J**	<0.0047	<0.00005	<0.005	<0.005	<0.050	<0.0047	<0.05	NA
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	**0.011 J**	**0.033 J**	<0.0082	<0.0001	<0.0091	<0.0091	<0.10	<0.014	<0.1	<0.0061
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006	<0.10	<0.0075	<0.1	<0.0073
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069	<0.10	<0.014	<0.1	<0.0092
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		<0.005		<0.017	<0.1	**0.0098 J**	**0.0066 J**	<0.0072	<0.0001	<0.0091	<0.0091	<0.10	<0.013	<0.1	0.011 J
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072	<0.050	<0.0038	<0.05	<0.0066
Methoxychlor	0.03	0.03	100	not established			<0.003		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043	<0.50	<0.08	<0.5	<0.012
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16	<5.0	<0.085	<5	<0.47
Total Pesticides Concentrations (ug/L)							0.354		0.169	0.57	0.5348	0.6106	0.361	0.544	0.265	0.446	0.399	0.536	0.382	--
Total Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	0.0041
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.00796**	0.01
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.001	<0.0005
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.736**	0.5
Dissolved Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		**0.00384**	**JQ**	**0.00534**	**0.00192 J**	**0.00121 J**	**0.00166 J**	**0.00206 J**	**0.00235 J**	**0.000954 J**	**0.00188 J**	<0.005	**0.00172 J**	<0.005	0.0023 J
Copper	0.0152*	0.0152*	1.3	not established			**0.00983**		**0.00854**	**0.00677**	**0.00659**	**0.00471**	**0.00773**	**0.0054**	**0.00442**	**0.00663**	**0.0149**	**0.00616**	**0.00404**	0.0054
Lead	0.0049*	0.0049*		not established			<0.000621		<0.000215	<0.001	**0.000782 J**	<0.001	<0.000309	<0.001	<0.000099	<0.0001	<0.001	<0.00014	<0.001	<0.0002
Zinc	0.200*	0.200*	7.4	26	not established		**0.190**		**0.146**	**0.477**	**0.557**	**0.407**	**0.444**	**0.407**	**0.456**	**0.427**	**0.706**	**0.593**	**0.629**	0.44
Total Dissolved Metals Concentrations (mg/L)							0.20367		0.15646	0.48569	0.565582	0.41337	0.45379	0.41475	0.461374	0.43551	0.0855	0.60088	0.63304	--
Total Trichlorobenzenes (ug/L)																				
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate and Sulfate (mg/L)																				
Nitrate as N	not established		10 (nitrates)		not established		**1.0**		**0.49**	**1.1**	**1.1 J**	**1.8 J**	**1.3 J**	**1.3**	**1.6**	**1.8**	**0.86**	**1.5**	0.79	NA
Sulfate	not established			not established			**63**		**37**	**89**	**100**	**99**	**100**	**80**	**92**	**89**	**95**	**97**	91	NA
Hardness as CaCo3 (mg/L)	not established			not established			NA		NA	NA	125	NA		NA	NA	NA	NA	NA	NA	NA
pH (std units)							7.22		7.07	6.88	6.35	7.13	7.27	7.53	7.12	7.44	6.42	6.98		
Specific Conductance (mS/cm)							0.329		0.229	0.447	0.508	0.527	0.533	0.429	0.465	0.615	0.66	0.849		
Turbidity (NTUs)							7.44		8.7	4	2.1	0	0	49.2	37.4	0	75.1	0		
DO (mg/L)							6.73		6	5.29	4.71	6.74	5.93	4.8	4.51	7.54	10.1	8.59		
ORP (mV)							99		94	158	190	109	130	104	47	122	140	119		

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2010-11		SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11	SW2010-11
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014	11/19/2013	5/30/2013	11/16/2012	9/23/2010
						Distance Along Stream (ft)	1222		1222	1222	1222	1222	1222	1222	1222	1222	1222	1222	1222	1222
Total Organochlorine Pesticides (ug/L)							Surface water sample from main channel downstream of culvert													
	Ecological Exposure		**Human Health Exposure**																	
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.12**		**0.049J**	**0.18**	**0.35**	**0.25**	**0.18**	**0.15**	**0.13**	**0.17**	**0.24**	**0.24**	**0.23**	0.19
beta-BHC	not established		0.0091	0.017	0.017		**0.046**	**JQ**	**0.057**	**0.099**	**1.1**	**0.43**	**0.092**	**0.24**	**0.091**	**0.3**	**0.29**	**0.29**	**0.27**	0.45
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.07**		**0.032J**	**0.085**	**0.15**	**0.12**	**0.073**	**0.069**	**0.044 J**	**0.074**	**0.091**	**0.097**	**0.098**	0.11
delta-BHC	not established		not established				**0.05**	**JQ**	**0.038J**	**0.091**	**0.16**	**0.15**	**0.074**	**0.15**	**0.077**	**0.27**	**0.11**	**0.19**	**0.16**	0.13 P
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022	<0.050	<0.0066	<0.05	<0.094
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	<0.05	<0.0047	<0.00005	<0.005	<0.005	<0.050	<0.0047	<0.05	NA
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	<0.1	**0.006 J**	<0.0082	<0.0001	<0.0091	<0.0091	<0.10	<0.014	<0.1	<0.0061
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006	<0.10	<0.0075	<0.1	<0.0073
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069	<0.10	<0.014	<0.1	<0.0092
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		<0.005		<0.017	<0.1	**0.022 J**	**0.011 J**	**0.016 J**	<0.0001	<0.0091	<0.0091	<0.10	<0.013	<0.1	0.012 J
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072	<0.050	<0.0038	<0.05	<0.0066
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043	<0.50	<0.08	<0.5	<0.012
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16	<5.0	<0.085	<5	<0.47
Total Pesticides Concentrations (ug/L)							0.286		0.176	0.455	1.782	0.967	0.435	0.609	0.342	0.814	0.731	0.817	0.758	--
Total Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	0.0059
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.128**	0.22
Lead	0.0049*	0.0049*	not established				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.00356**	0.012
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.09**	3
Dissolved Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		**0.00434**	**JQ**	**0.00539**	**0.00174 J**	**0.000646 J**	**0.00126 J**	**0.00168 J**	**0.00236 J**	**0.00102 J**	**0.00174 J**	<0.005	**0.00121 J**	<0.005	0.0016 J
Copper	0.0152*	0.0152*	1.3	not established			**0.0127**		**0.0216**	**0.00631**	**0.256**	**0.0527**	**0.00669**	**0.00514**	**0.00434**	**0.00567**	**0.0932**	**0.0564**	**0.0572**	0.097
Lead	0.0049*	0.0049*	not established				<0.000621		**0.00024J**	<0.001	<0.001	<0.001	<0.000309	<0.001	<0.000099	<0.0001	<0.001	<0.00014	<0.001	<0.0002
Zinc	0.200*	0.200*	7.4	26	not established		**0.182**		**0.413**	**0.472**	**5.92**	**1.6**	**0.399**	**0.406**	**0.435**	**0.377**	**1.68**	**1.6**	**1.74**	2.7
Total Dissolved Metals Concentrations (mg/L)							0.19904		0.44023	0.48005	6.176646	1.65396	0.40737	0.4135	0.44036	0.38441	1.7732	1.65761	1.7972	--
Total Trichlorobenzenes (ug/L)																				
1,2,3-Trichlorobenzene	not established		not established				NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.56
Nitrate and Sulfate (mg/L)																				
Nitrate as N	not established		10 (nitrates)		not established		**1.0**		**0.53**	**1.2**	**5.4**	**3.2**	**1.8 J**	**1.3**	**1.6**	**1.7**	**2.2**	**3.0**	**3.1**	4.1
Sulfate	not established		not established				**62**		**38**	**91**	**240**	**160**	**100**	**82**	**94**	**88**	**120**	**140**	**130**	220
Hardness as CaCo3 (mg/L)	not established		not established				NA		NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
pH (std units)							7.20		6.68	6.71	6.14	7.02	7.49	7.34	7.93	7.33	6.43	6.94		
Specific Conductance (mS/cm)							0.356		0.336	0.485	0.677	0.605	0.598	0.505	0.553	0.615	0.66	0.963		
Turbidity (NTUs)							1.61		1.3	0.3	0	0	8.4	26.6	3.67	0	67.1	14.2		
DO (mg/L)							10.08		7.07	7.29	4.83	6.54	7.23	4.54	9.2	8.16	9.98	7.07		
ORP (mV)							105		143	170	213	117	118	92	82	150	134	186		

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2010-14		SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14	SW2010-14
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014	11/19/2013	5/30/2013	11/16/2012	9/23/2010
						Distance Along Stream (ft)	1667		1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
Total Organochlorine Pesticides (ug/L)							Surface water sample from main channel downstream of culvert													
	Ecological Exposure			**Human Health Exposure**																
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.26**		**0.12**	**0.38**	**0.41**	**0.31**	**0.2**	**0.26**	**0.30**	**0.31**	**0.40**	**0.38**	**0.53**	0.62
beta-BHC	not established		0.0091	0.017	0.017		**0.36**		**0.29**	**0.52**	**0.57**	**0.53**	**0.3**	**0.55**	**0.41**	**0.38**	**0.44**	**0.47**	**0.46**	0.73
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.10**		**0.04J**	**0.13**	**0.1**	**0.11**	**0.071**	**0.083**	**0.086**	**0.093**	**0.12**	**0.12**	**0.15**	0.22
delta-BHC	not established			not established			**0.16**		**0.12**	**0.26**	**0.3**	**0.22**	**0.12**	**0.26**	**0.32**	**0.46**	**0.29**	**0.37**	**0.53**	0.48 P
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022	<0.050	<0.0066	<0.05	<0.095
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	<0.05	<0.0047	<0.00005	<0.005	<0.005	<0.050	<0.0047	<0.05	NA
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	**0.0075 J**	<0.1	<0.0082	<0.0001	<0.0091	<0.0091	<0.10	<0.014	<0.1	<0.0062
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006	<0.10	<0.0075	<0.1	<0.0073
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069	<0.10	<0.014	<0.1	<0.0092
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		**0.0083**	**JQ**	<0.017	<0.1	**0.014 J**	**0.011 J**	**0.014 J**	**0.015 J**	<0.0091	<0.0091	<0.10	<0.013	<0.1	0.015 J
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072	<0.050	<0.0038	<0.05	<0.0067
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043	<0.50	<0.08	<0.5	<0.012
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16	<5.0	<0.085	<5	<0.48
Total Pesticides Concentrations (ug/L)							0.8883		0.57	1.29	1.4015	1.181	0.705	1.168	1.116	1.243	1.25	1.34	1.67	--
Total Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	0.028
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0918**	0.78
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.001	0.014
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.46**	15
Dissolved Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		**0.00211**	**JQ**	**0.00328J**	**0.000923 J**	**0.001 J**	**0.000976 J**	**0.00109 J**	**0.00127 J**	**0.000716 J**	**0.0009 J**	<0.005	**0.00086 J**	<0.01	<0.0013
Copper	0.0152*	0.0152*	1.3	not established			**0.0242**		**0.0332**	**0.0177**	**0.0484**	**0.0197**	**0.0159**	**0.015**	**0.0183**	**0.0244**	**0.0463**	**0.0393**	**0.0215**	0.048
Lead	0.0049*	0.0049*		not established			<0.000621		**0.000274J**	<0.001	**0.000375 J**	<0.001	<0.000309	<0.001	<0.000099	<0.0001	<0.001	<0.00014	<0.002	<0.0002
Zinc	0.200*	0.200*	7.4	26	not established		**0.721**		**0.789**	**1.18**	**1.38**	**1.27**	**0.8**	**0.852**	**1.27**	**1.11**	**1.89**	**1.62**	**1.96**	2.5
Total Dissolved Metals Concentrations (mg/L)							0.74731		0.825754	1.198623	1.429775	1.290676	0.81699	0.86827	1.289016	1.1353	1.9363	1.66016	1.9815	--
Total Trichlorobenzenes (ug/L)																				
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate and Sulfate (mg/L)																				
Nitrate as N	not established		10 (nitrates)		not established		**1.4**		**1.1**	**1.6**	**2.1 J**	**2.5 J**	**1.8 J**	**1.8**	**1.9**	**2.2**	**1.9**	**2.5**	**2.3**	NA
Sulfate	not established			not established			**92**		**64**	**130**	**160**	**160**	**130**	**110**	**140**	**130**	**130**	**140**	**140**	NA
Hardness as CaCo3 (mg/L)	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (std units)							7.14		6.98	6.21	6.44	7.29	7.38	7.67	6.98	7.19	6.43	7.03		
Specific Conductance (mS/cm)							0.380		0.251	0.549	0.626	0.689	0.645	0.532	0.593	0.58	0.734	1.05		
Turbidity (NTUs)							0.0		7.7	0.6	0.0	0	9.9	1.6	13.2	0	25.7	0		
DO (mg/L)							9.24		4.32	7.21	5.16	5.34	6.75	4.68	10.44	10.44	9.49	10.02		
ORP (mV)							79		109	166	193	94	108	92	64	139	134	189		

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2010-15		SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15	SW2010-15
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014	11/19/2013	5/30/2013	11/16/2012	9/23/2010
						Distance Along Stream (ft)	1761		1761	1761	1761	1761	1761	1761	1761	1761	1761	1761	1761	1761
Total Organochlorine Pesticides (ug/L)							Surface water sample from main channel downstream of culvert													
	Ecological Exposure		**Human Health Exposure**																	
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.20**	**JH**	**0.1**	**0.32**	**0.37**	**0.3**	**0.2**	**0.17**	**0.29**	**0.27**	**0.36**	**0.32**	**0.53**	0.62
beta-BHC	not established		0.0091	0.017	0.017		**0.30**	**JH**	**0.27**	**0.47**	**0.51**	**0.49**	**0.29**	**0.45**	**0.4**	**0.36**	**0.40**	**0.41**	**0.46**	0.75
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.084**	**JH**	**0.044J**	**0.11**	**0.087**	**0.11**	**0.065**	**0.057**	**0.082**	**0.087**	**0.11**	**0.1**	**0.15**	0.22
delta-BHC	not established			not established			**0.21**	**JH**	**0.088**	**0.22**	**0.25**	**0.2**	**0.11**	**0.21**	**0.28**	**0.43**	**0.27**	**0.34**	**0.48**	0.44 P
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022	<0.050	<0.0066	<0.05	<0.095
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	<0.05	<0.0047	<0.00005	<0.005	<0.005	<0.050	<0.0047	<0.05	NA
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	<0.1	<0.1	<0.0082	<0.0001	<0.0091	<0.0091	<0.10	<0.014	<0.1	<0.0062
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006	<0.10	<0.0075	<0.1	<0.0073
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	**0.0068 J**	<0.0001	<0.0069	<0.0069	<0.10	<0.014	<0.1	<0.0092
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		<0.005		<0.017	<0.1	**0.012 J**	**0.01 J**	<0.0072	**0.012 J**	<0.0091	<0.0091	<0.10	<0.013	<0.1	0.017 J
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.5	<0.05	<0.0079	<0.00005	<0.0072	<0.0072	<0.050	<0.0038	<0.05	<0.0067
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043	<0.50	<0.08	<0.5	<0.012
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16	<5.0	<0.085	<5	<0.48
Total Pesticides Concentrations (ug/L)							0.794		0.502	1.12	1.229	1.1	0.6718	0.899	1.052	1.147	1.14	1.17	1.62	--
Total Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	0.0025
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0701**	0.084
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.001	<0.0005
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.18**	2.4
Dissolved Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		**0.00241**	**JQ**	**0.00322J**	**0.00104 J**	**0.000886 J**	**0.000952 J**	**0.00115**	**0.0013 J**	**0.000827 J**	**0.00096 J**	<0.005	**0.00098 J**	<0.01	<0.0013
Copper	0.0152*	0.0152*	1.3	not established			**0.023**		**0.0289**	**0.0156**	**0.0276**	**0.0222**	**0.0144**	**0.0108**	**0.018**	**0.0181**	**0.0382**	**0.0275**	**0.0179**	0.038
Lead	0.0049*	0.0049*		not established			<0.000621		**0.000278J**	<0.001	**0.00022 J**	<0.001	<0.000309	<0.001	<0.000099	<0.0001	<0.001	<0.00014	<0.002	<0.0002
Zinc	0.200*	0.200*	7.4	26	not established		**0.641**		**0.638**	**1.04**	**1.43**	**1.29**	**0.74**	**0.693**	**1.23**	**0.965**	**1.91**	**1.51**	**1.77**	2.2
Total Dissolved Metals Concentrations (mg/L)							0.66641		0.670398	1.05664	1.458706	1.313152	0.75555	0.70493	1.248827	0.98406	1.9482	1.53848	1.7879	--
Total Trichlorobenzenes (ug/L)																				
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.95
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.53
Nitrate and Sulfate (mg/L)																				
Nitrate as N	not established		10 (nitrates)		not established		**1.4**		**1.0**	**1.7**	**2.2 J**	**2.6**	**1.6 J**	**1.7**	**1.8**	**2.2**	**1.8**	**2.4**	**2.2**	530
Sulfate	not established			not established			**90**		**59**	**140**	**170**	**160**	**130**	**110**	**150**	**130**	**130**	**140**	**150**	330
Hardness as CaCo3 (mg/L)	not established			not established			NA		NA	NA	175	NA		NA	NA	NA	NA	NA	NA	NA
pH (std units)							7.16		6.89	7.31	6.38	7.05	7.15	7.62	6.87	7.36	6.71	7.19		
Specific Conductance (mS/cm)							0.381		0.24	0.551	0.626	0.686	0.641	0.532	0.606	0.641	0.722	1.05		
Turbidity (NTUs)							0.0		10.7	0.4	2.9	0	11.7	13.7	3.89	9.81	22.8	25.7		
DO (mg/L)							6.6		4.40	6.9	6.35	6.09	6.94	4.75	11.09	9.93	4.03	8.93		
ORP (mV)							79		126	163	185	83	86	77	85	130	137	181		

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2010-17		SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17	SW2010-17
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014	11/19/2013	5/30/2013	11/16/2012	9/23/2010
						Distance Along Stream (ft)	2099		2099	2099	2099	2099	2099	2099	2099	2099	2099	2099	2099	2099
Total Organochlorine Pesticides (ug/L)							Surface water sample from main channel downstream of culvert													
	Ecological Exposure		**Human Health Exposure**																	
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.2**	**JH**	**0.081**	**0.31**	**0.47**	**0.29**	**0.18**	**0.2**	**0.29**	**0.24**	**0.33**	**0.32**	**0.45**	0.31
beta-BHC	not established		0.0091	0.017	0.017		**0.3**	**JH**	**0.2**	**0.44**	**0.47**	**0.52**	**0.27**	**0.48**	**0.37**	**0.33**	**0.40**	**0.39**	**0.39**	0.48
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.091**	**JH**	**0.039J**	**0.11**	**0.12**	**0.11**	**0.055**	**0.068**	**0.082**	**0.075**	**0.098**	**0.096**	**0.13**	0.11
delta-BHC	not established			not established			**0.21**	**JH**	**0.068**	**0.2**	**0.27**	**0.21**	**0.095**	**0.23**	**0.26**	**0.4**	**0.24**	**0.36**	**0.42**	0.21 P
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	**0.0045 J**	<0.05	<0.014	<0.00005	<0.0022	<0.0022	<0.050	<0.0066	<0.05	<0.094
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	0.05	<0.05	<0.0047	<0.00005	<0.005	<0.005	<0.050	<0.0047	<0.05	NA
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	<0.1	<0.1	<0.0082	<0.0001	<0.0091	<0.0091	<0.10	<0.014	<0.1	<0.0061
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006	<0.10	<0.0075	<0.1	<0.0073
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069	<0.10	<0.014	<0.1	<0.0092
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		<0.005		<0.017	<0.1	**0.011 J**	**0.011 J**	<0.0072	**0.013 J**	<0.0091	<0.0091	<0.10	<0.013	<0.1	<0.0086
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072	<0.050	<0.0038	<0.05	<0.0066
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043	<0.50	<0.08	<0.5	<0.012
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16	<5.0	<0.085	<5	<0.47
Total Pesticides Concentrations (ug/L)							0.801		0.388	1.06	1.3455	1.141	0.6	0.991	1.002	1.045	1.068	1.166	1.39	--
Total Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	0.0029
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0544**	0.054
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.001	<0.0005
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.83**	1.9
Dissolved Metals (mg/L)																				
Arsenic	0.15	0.15	0.000018	0.00014	0.01		**0.0024**	**JQ**	**0.00298J**	**0.00124 J**	**0.00114 J**	**0.00112 J**	**0.00111 J**	**0.00143 J**	**0.000935 J**	**0.00122 J**	<0.005	**0.00096 J**	<0.01	0.0013 J
Copper	0.0152*	0.0152*	1.3	not established			**0.0251**		**0.0225**	**0.0115**	**0.0165**	**0.0116**	**0.0107**	**0.00947**	**0.014**	**0.017**	**0.0314**	**0.0225**	**0.0127**	0.024
Lead	0.0049*	0.0049*		not established			<0.000621		**0.000294J**	<0.001	**0.000382 J**	<0.001	<0.000309	<0.001	<0.000099	<0.0001	**0.00126**	<0.00014	<0.002	<0.0002
Zinc	0.200*	0.200*	7.4	26	not established		**0.587**		**0.461**	**0.868**	**1.2**	**0.89**	**0.704**	**0.697**	**1.12**	**0.956**	**1.75**	**1.31**	**1.47**	1.6
Total Dissolved Metals Concentrations (mg/L)							0.6145		0.486774	0.88074	1.218022	0.90272	0.71581	0.7079	1.134935	0.97422	1.78266	1.33346	1.4827	--
Total Trichlorobenzenes (ug/L)																				
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate and Sulfate (mg/L)																				
Nitrate as N	not established		10 (nitrates)		not established		**1.3**		**0.83**	**1.6**	**2 J**	**2.6**	**1.6 J**	**1.7**	**1.8**	**2.1**	**1.8**	**2.3**	**1.9**	NA
Sulfate	not established			not established			**88**		**48**	**130**	**160**	**150**	**120**	**110**	**150**	**120**	**130**	**140**	**130**	NA
Hardness as CaCo3 (mg/L)	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (std units)							6.79		6.76	7.05	5.8	7.21	6.7	7.16	6.26	6.59	6.82	7.38		
Specific Conductance (mS/cm)							0.376		0.228	0.547	0.636	0.678	0.647	0.533	0.593	0.643	0.734	1.04		
Turbidity (NTUs)							0.0		5	9.6	15.0	8.9	14.1	11.5	8.74	0	0	10.1		
DO (mg/L)							7.92		4.99	7.56	7.68	6.66	7.99	5.66	13.76	14.19	6.99	7.6		
ORP (mV)							99		110	137	184	115	35	33	145	92	52	181		

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2014-20		SW2014-20	SW2014-20	SW2014-20	SW2014-20	SW2014-20	SW2014-20	SW2014-20	SW2014-20
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014
						Distance Along Stream (ft)	Side seep inflowing into drainage feature located on west side of track and upstream of railroad culvert location SW-2010-11									
Total Organochlorine Pesticides (ug/L)							Seep sample									
	Ecological Exposure		**Human Health Exposure**													
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.18**		**0.24**	**0.37**	**0.54**	**0.44**	**0.33**	**0.33**	**0.14**	**0.28**
beta-BHC	not established		0.0091	0.017	0.017		**1.1**		**1.6**	**1.8**	**3.0**	**3.4**	**2.1**	**2.2**	**1.5**	**1.0**
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.11**		**0.13**	**0.21**	**0.25**	**0.22**	**0.16**	**0.16**	**0.078**	**0.13**
delta-BHC	not established			not established			**0.10**		**0.2**	**0.18**	**0.28**	**0.29**	**0.17**	**0.3**	**0.18**	**0.49**
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	<0.05	<0.0047	<0.00005	<0.005	<0.005
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	<0.1	<0.1	<0.0082	<0.0001	<0.0091	<0.0091
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		**0.023**	**JQ**	**0.033J**	**0.03 J**	**0.056 J**	**0.049 J**	**0.038 J**	**0.046 J**	<0.0091	**0.021 J**
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	**0.032 J**	<0.5	<0.056	<0.0005	<0.043	<0.043
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16
Total Pesticides Concentrations (ug/L)							1.513		2.203	2.59	4.158	4.399	2.798	3.036	1.898	1.921
Total Metals (mg/L)																
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (mg/L)																
Arsenic	0.15	0.15	0.000018	0.00014	0.01		<0.041		<0.000156	**0.000491 J**	**0.000316 J**	**0.000441 J**	**0.000183 J**	**0.000338 J**	<0.000536	<0.00054
Copper	0.0152*	0.0152*	1.3	not established			**0.119**		**0.195**	**0.25**	**0.641**	**0.509**	**0.227**	**0.148**	**0.157**	**0.229**
Lead	0.0049*	0.0049*		not established			<0.000621		<0.000215	<0.001	**0.000388 J**	**0.000147 J**	<0.000309	<0.001	**0.00281**	<0.0001
Zinc	0.200*	0.200*	7.4	26	not established		**3.2**		**5.24**	**4.5**	**11.8**	**7.7**	**5.84**	**5.86**	**4.24**	**5.65**
Total Dissolved Metals Concentrations (mg/L)							**3.319**		**5.435**	**4.750491**	12.441704	8.209588	6.067183	6.008338	4.39981	5.879
Total Trichlorobenzenes (ug/L)																
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA
Nitrate and Sulfate (mg/L)																
Nitrate as N	not established		10 (nitrates)		not established		**5.4**	**JH**	**6.2**	**5.9**	**11**	**11**	**6.9**	**7.1**	**8.3**	**9.5**
Sulfate	not established			not established			**200**		**230**	**240**	**420**	**470**	**300**	**270**	**350**	**330**
Hardness as CaCo3 (mg/L)	not established			not established			NA		NA	NA	258	NA	NA	NA	NA	NA
pH (std units)							6.83		6.57	6.82	5.52	6.14	6.67	7.07	6.57	6.74
Specific Conductance (mS/cm)							0.569		0.548	0.658	0.909	1.12	0.821	0.783	0.867	1.09
Turbidity (NTUs)							0.0		0.0	1.1	0.0	21.6	0.2	139	13.5	0
DO (mg/L)							10.67		3.90	5.6	3.58	5.26	5.37	2.99	7.14	7.62
ORP (mV)							98		147	195	223	158	175	153	120	179

TABLE 4: SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

PARAMETER, UNITS	GA Instream	National AWQC	National AWQC Human Consumption of Water + Organism	National AWQC Human Consumption of Water	GA Instream Human Health	Sample Location	SW2014-21		SW2014-21	SW2014-21	SW2014-21	SW2014-21	SW2014-21	SW2014-21	SW2014-21	SW2014-21
						Sample Date	5/18/2018		11/9/2017	5/11/2017	11/15/2016	6/9/2016	11/18/2015	6/4/2015	11/19/2014	5/20/2014
						Distance Along Stream (ft)	Side seep inflowing into drainage feature on west side of track and about 85 ft upstream of location SW2014-20									
Total Organochlorine Pesticides (ug/L)							Seep sample									
	Ecological Exposure		**Human Health Exposure**													
alpha-BHC	not established		0.0026	0.0049	0.0049		**0.14**		**0.15**	**0.29**	**0.38**	**0.31**	**0.17**	**0.25**	**0.2**	**0.22**
beta-BHC	not established		0.0091	0.017	0.017		**1.2**		**1.2**	**3.4**	**3.9**	**3.8**	**2.2**	**2.2**	**1.2**	**1.2**
gamma-BHC (lindane)	0.95 (acute)	0.95 (acute)	0.98	1.8	1.8		**0.091**		**0.07**	**0.22**	**0.18**	**0.18**	**0.092**	**0.13**	**0.10**	**0.11**
delta-BHC	not established			not established			**0.1**		**0.17**	**0.24**	**0.27**	**0.29**	**0.13**	**0.22**	**0.15**	**0.53**
Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.02		<0.039	<0.05	<0.05	<0.05	<0.014	<0.00005	<0.0022	<0.0022
gamma-Chlordane	0.0043	0.0043	0.0008	0.00081	0.00081		<0.013		<0.062	<0.05	<0.05	<0.05	<0.0047	<0.00005	<0.0050	<0.005
4,4'-DDD	not established		0.00031	0.00031	0.00031		<0.014		<0.016	<0.1	<0.1	<0.1	<0.0082	<0.0001	<0.0091	<0.0091
4,4'-DDE	not established		0.00022	0.00022	0.00022		<0.01		<0.024	<0.1	<0.1	<0.1	<0.0069	<0.0001	<0.006	<0.006
4,4'-DDT	0.001	0.001	0.00022	0.00022	0.00022		<0.007		<0.026	<0.1	<0.1	<0.1	<0.0063	<0.0001	<0.0069	<0.0069
Dieldrin	0.056	0.056	0.000052	0.000054	0.000054		**0.030**	**JQ**	**0.026J**	**0.058 J**	**0.066 J**	**0.066 J**	**0.041 J**	**0.043 J**	<0.0091	**0.020 J**
Heptachlor	0.0038	0.0038	0.000079	0.000079	0.000079		<0.005		<0.026	<0.05	<0.05	<0.05	<0.0079	<0.00005	<0.0072	<0.0072
Methoxychlor	0.03	0.03	100	not established			<0.03		<0.057	<0.5	<0.5	<0.5	<0.056	<0.0005	<0.043	<0.043
Toxaphene	0.0002	0.0002	0.00028	0.00028	0.00028		<0.062		<0.21	<3.0	<3	<3	<0.18	<0.005	<0.16	<0.16
Total Pesticides Concentrations (ug/L)							1.561		1.616	4.208	4.796	4.646	2.633	2.843	1.65	2.06
Total Metals (mg/L)																
Arsenic	0.15	0.15	0.000018	0.00014	0.01		NA		NA	NA	NA	NA	NA	NA	NA	NA
Copper	0.0152*	0.0152*	1.3	not established			NA		NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.0049*	0.0049*		not established			NA		NA	NA	NA	NA	NA	NA	NA	NA
Zinc	0.200*	0.200*	7.4	26	not established		NA		NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (mg/L)																
Arsenic	0.15	0.15	0.000018	0.00014	0.01		<0.041		<0.000156	**0.000342 J**	**0.000312 J**	**0.000321 J**	**0.000180 J**	**0.000272 J**	<0.000536	<0.00054
Copper	0.0152*	0.0152*	1.3	not established			**0.14**		**0.122**	**0.756**	**0.901**	**0.682**	**0.327**	**0.348**	**0.0714**	**0.296**
Lead	0.0049*	0.0049*		not established			<0.000621		<0.000215	<0.001	**0.00053 J**	**0.000321 J**	<0.000309	<0.001	<0.000099	<0.0001
Zinc	0.200*	0.200*	7.4	26	not established		**3.41**		**2.64**	**9.67**	**12.4**	**8.45**	**6.35**	**7.05**	**3.75**	**6.13**
Total Dissolved Metals Concentrations (mg/L)							3.55		2.762	10.426342	12.490942	9.132642	6.67718	7.398272	3.8214	6.426
Total Trichlorobenzenes (ug/L)																
1,2,3-Trichlorobenzene	not established			not established			NA		NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	not established		35	70	70		NA		NA	NA	NA	NA	NA	NA	NA	NA
Nitrate and Sulfate (mg/L)																
Nitrate as N	not established		10 (nitrates)		not established		**5.4**	**JH**	**0.56**	**8.9**	**11**	**11**	**7.6**	**8.4**	**8.1**	**9.9**
Sulfate	not established			not established			**190**		**40**	**380**	**410**	**470**	**310**	**310**	**280**	**360**
Hardness as CaCo3 (mg/L)	not established		not established				NA		NA	NA	NA	NA		NA	NA	NA
pH (std units)							6.53		6.6	6.38	5.24	5.95	6.63	6.82	6.58	6.75
Specific Conductance (mS/cm)							0.588		0.463	0.803	0.888	1.13	0.858	0.797	0.876	1.14
Turbidity (NTUs)							1.86		6.2	4.9	20.1	5.3	0	0.2	62.5	0
DO (mg/L)							6.83		2.82	4.7	2.83	6.47	4.72	2.14	8.02	7.09
ORP (mV)							129		142	209	192	157	173	135	115	156

Notes:

<0.025 = Constituent not detected above the detection limit shown
ug/L = micrograms per liter
mg/L = milligrams per liter
J = Result reported between the method detection limit (MDL) and reporting limit (RL). Result is a quantitative estimate.
J Q= Estimated, detected between the method detection limit (MDL) and reporting limit (RL).
J H= Estimated, possibly biased high
P = Identification of target analytes using gas chromatography (GC) is based on retention time. Although 2 dissimilar GC columns confirmed the presence of the target analyte in the sample, relative percent difference is >40%.
NA = constituent not analyzed
* = criteria is based on an average hardness of 186 mg/L from November 2016
Bolded = indicates a positive detection in the 2012 through 2018 results
2012 through 2018 Sampling Results that exceeded Georgia Instream Concentrations (GEPD 2013) for Ecological Exposure
2012 through 2018 Sampling Results that exceeded Georgia Instream Concentrations (GEPD 2013) for Human Health Exposure (used when there was not an ecological exposure criteria)

Prepared by: AS 7/2/2018
Checked by: RNQ 7/6/2018

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-1B	MW-1B	MW-1B	MW-1B	MW-1B	MW-1B	MW-1B	MW-1B	MW-1B	MW-22	MW-22	MW-22	MW-22	MW-22
Date Sampled		**5/8/2018**	**10/31/2017**	**5/2/2017**	**11/8/2016**	**11/8/2016**	**6/1/2016**	**11/10/2015**	**5/27/2015**	**11/11/2014**	**5/15/2018**	**11/1/2017**	**5/4/2017**	**11/8/2016**	**6/6/2016**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**7.2**	<5.0	<5.0	<5.0	**6.9**
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200		<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**12**	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**7.2**	**12**	BDL	BDL	**6.9**

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-22	MW-22	MW-22	MW-22	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-26	MW-26	MW-26	MW-26
Date Sampled		**11/12/2015**	**5/29/2015**	**11/12/2014**	**9/13/2010**	**5/17/2018**	**5/10/2017**	**11/10/2016**	**6/7/2016**	**11/13/2015**	**6/2/2015**	**5/10/2018**	**11/1/2017**	**5/3/2017**	**11/9/2016**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L				<1										
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0		<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<9.5	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<10	<50.0	<50.0	<50.0	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<25	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<10	<10	<1	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	**8.1**	**10**	**9.2**	**2.7**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200			<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0		<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0		<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	**8.1**	**10**	**9.2**	**2.7**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-26	MW-26	MW-26	MW-101	MW-101	MW-101	MW-101	MW-101	MW-101	MW-101	MW-101	MW-102	MW-102	MW-102
Date Sampled		**6/2/2016**	**11/11/2015**	**5/28/2015**	**5/9/2018**	**11/1/2017**	**5/2/2017**	**11/8/2016**	**6/1/2016**	**11/10/2015**	**5/27/2015**	**11/11/2014**	**5/8/2018**	**10/31/2017**	**5/2/2017**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50.0	<50.0	<50.0	<50.0	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200		<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-102	MW-102	MW-102	MW-102	MW-104A	MW-104A	MW-104A	MW-104A	MW-104A	MW-104A	MW-104A	MW-104A	MW-104A	MW-104D
Date Sampled		**11/8/2016**	**6/2/2016**	**11/10/2015**	**5/27/2015**	**5/9/2018**	**11/2/2017**	**5/3/2017**	**11/8/2016**	**6/3/2016**	**11/11/2015**	**6/1/2015**	**11/12/2014**	**9/15/2010**	**5/9/2018**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Shallow Fractured Bedrock
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L													<1	
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<1	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	**73**	**48,000**
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<10	**260,000**
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	**97,000**
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<25	**230,000**
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Chloromethane	ug/L	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<1	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	**4,600**
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200			<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	**38,000**
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	**6.9**	**6.7**	<5.0	<5.0	<5.0	<5.0	<5.0	<1	**53,000**
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<2	**15,000**
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	**6.9**	**6.7**	BDL	BDL	BDL	BDL	BDL	**73**	**745,600**

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-104D	MW-104D	MW-104D	MW-104D	MW-104D	MW-104D	MW-104D	MW-104D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D
Date Sampled		**11/2/2017**	**5/3/2017**	**11/9/2016**	**6/6/2016**	**11/12/2015**	**6/3/2015**	**11/13/2014**	**9/15/2010**	**5/11/2018**	**11/6/2017**	**5/8/2017**	**11/9/2016**	**6/7/2016**	**11/13/2015**
Lithology Screened		Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L								<200						
1,1,1-Trichloroethane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5000	<5000	<5000	<5000	**28**	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0		<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150000	<150000	<150,000	<150000	**20,000**		**11,000**	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	**200,000**	**250,000**	**320,000**	**350,000**	**350,000**	**210,000**	**260,000**	**380,000**	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	**89,000**	**85,000**	**110,000**	**130,000**	**110,000**	**100,000**	**120,000**	**140,000**	<10	<10	<10	<10	<10	<10
Acetone	ug/L	**180,000**	**200,000**	**240,000**	**290,000**	**390,000**	**200,000**	**290,000**	**370,000**	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5000	<5000	<5000	<5000	**360**	**290**	**330**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5000	<5000	<5000	<5000	**20**	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10000	<10000	<10000	<10000	**100**	<500	**390**	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5000	<5000	<5000	<10000	<10	<500	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<10
cis-1,2-Dichloroethene	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5000	<5000	<5000	<5000	**4,200**	**4,300**	**3,900**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200000	<200000	<200,000	<200000	<200			<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5000	<5000	<5000	<5000	**67**	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5000	<5000	<5000	<5000	**52**	<250	<1000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5000	<5000	<5000	<5000	**120**		<1000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	**53,000**	**44,000**	**60,000**	**72,000**	**57,000**	**49,000**		**69,000**	<10	<10	<10	<10	<10	<10
Toluene	ug/L	**54,000**	**74,000**	**69,000**	**83,000**	**66,000**	**71,000**	**67,000**	**62,000**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5000	<5000	<5000	<5000	**40**	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5000	<5000	<5000	<5000	<5.0	<250	<200	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2000	<2000	<2000	<2000	<2.0	<100	<200	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	**13,000**	**20,000**	**21,000**	**18,000**	**22,000**	**21,000**	**19,700**	**18,000**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	**589,000**	**673,000**	**820,000**	**943,000**	**995,000**	**675,987**	**761,290**	**1,054,620**	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-106D	MW-107D	MW-107D	MW-107D	MW-107D	MW-107D	MW-107D	MW-107D	MW-108	MW-108	MW-108	MW-108	MW-108	MW-108
Date Sampled		**6/2/2015**	**5/9/2018**	**11/3/2017**	**5/4/2017**	**11/9/2016**	**6/6/2016**	**11/12/2015**	**6/1/2015**	**5/10/2018**	**11/2/2017**	**5/3/2017**	**11/10/2016**	**6/2/2016**	**11/11/2015**
Lithology Screened		Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**5.4**	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**5.4**	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-108	MW-109	MW-109	MW-109	MW-109	MW-109	MW-109	MW-109	MW-110	MW-110	MW-110	MW-110	MW-110	MW-110
Date Sampled		**5/28/2015**	**5/15/2018**	**11/7/2017**	**5/9/2017**	**11/10/2016**	**6/8/2016**	**11/16/2015**	**6/3/2015**	**5/11/2018**	**11/2/2017**	**5/5/2017**	**11/10/2016**	**6/3/2016**	**11/11/2015**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	**6.6**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**7.9**	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	**6.6**	BDL	BDL	BDL	**7.9**	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-110	MW-110	MW-111	MW-111	MW-111	MW-111	MW-111	MW-111	MW-111	MW-112	MW-112	MW-112	MW-112	MW-112
Date Sampled		**5/29/2015**	**11/12/2014**	**5/15/2018**	**11/8/2017**	**5/9/2017**	**11/10/2016**	**6/8/2016**	**11/16/2015**	**6/3/2015**	**5/10/2018**	**11/1/2017**	**5/2/2017**	**11/9/2016**	**6/2/2016**
Lithology Screened		Shallow Fractured Bedrock	Shallow Fractured Bedrock	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	**96**	**86**	**110**	**80**	**100**	**93**	**97**	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200		<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	**96**	**86**	**110**	**80**	**100**	**93**	**97**	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-112	MW-112	MW-113	MW-113	MW-113	MW-113	MW-113	MW-113	MW-113	MW-114	MW-114	MW-114	MW-114	MW-114
Date Sampled		**11/10/2015**	**5/28/2015**	**5/14/2018**	**11/6/2017**	**5/8/2017**	**11/10/2016**	**6/7/2016**	**11/16/2015**	**6/2/2015**	**5/14/2018**	**11/6/2017**	**5/8/2017**	**11/10/2016**	**6/7/2016**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	**46**	**79**	**85**	**66**	**60**	**58**	**56**	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	**26**	**88**	**84**	**62**	**51**	**51**	**44**	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	**72**	**167**	**169**	**128**	**111**	**109**	**100**	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-114	MW-114	MW-115	MW-115	MW-115	MW-115	MW-115	MW-115	MW-115	MW-116	MW-116	MW-116	MW-116	MW-116
Date Sampled		**11/16/2015**	**6/2/2015**	**5/10/2018**	**11/3/2017**	**5/5/2017**	**11/10/2016**	**6/7/2016**	**11/16/2015**	**6/1/2015**	**5/14/2018**	**11/2/2017**	**5/4/2016**	**11/10/2016**	**6/3/2016**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<5.00	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-116	MW-116	MW-117	MW-117	MW-117	MW-117	MW-117	MW-117	MW-119	MW-119	MW-119	MW-119	MW-119	MW-119
Date Sampled		**11/12/2015**	**5/28/2015**	**5/10/2018**	**11/3/2017**	**11/3/2017**	**5/4/2017**	**11/10/2016**	**6/3/2016**	**5/15/2018**	**11/7/2017**	**5/9/2017**	**11/11/2016**	**6/8/2016**	**11/17/2015**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	**750**	<150	<150	<150	**340**	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**750**	BDL	BDL	BDL	**340**	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-119	MW-119	MW-120	MW-120	MW-120	MW-120	MW-120	MW-120	MW-120	MW-120	MW-121	MW-121	MW-121	MW-121
Date Sampled		**6/5/2015**	**11/18/2014**	**5/16/2018**	**11/7/2017**	**5/9/2017**	**11/11/2016**	**6/8/2016**	**11/17/2015**	**6/4/2015**	**11/19/2014**	**5/11/2018**	**11/7/2017**	**5/10/2017**	**11/11/2016**
Lithology Screened		Residual Soil	Residual Soil	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	**370**		<150	<150	<150	<150	<150	<150	**220**	**420**	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**0.87 J**	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	**14**	**16**	**13**	**12**	**11**	**8.6**	**7.1**	**7.6**	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200		<200	<200	<200	<200	<200	<200	<200		<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10		<10	<10	<10	<10	<10	<10	<10		<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	**6.8**	**9.3**	**6.2**	**6.5**	**6.3**	**8.5**	<5.0	**3.4 J**	<5.0	**5.4**	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	**370**	BDL	**20.8**	**25.3**	**19.2**	**18.5**	**17.3**	**17.1**	**227.1**	**427.6**	BDL	**5.4**	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		MW-121	MW-121	MW-121	TW-1	TW-1	TW-1	TW-1	TW-1	TW-1	TW-1	TW-2	TW-2	TW-2	TW-2
Date Sampled		**6/7/2016**	**11/13/2015**	**6/5/2015**	**5/9/2018**	**11/1/2017**	**5/3/2017**	**11/9/2016**	**6/2/2016**	**11/11/2015**	**5/28/2015**	**5/11/2018**	**11/2/2017**	**5/4/2017**	**11/9/2016**
Lithology Screened		Shallow Fractured Bedrock	Shallow Fractured Bedrock	Shallow Fractured Bedrock	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	**5.0**	**8.3**	<5.0	**6.6**	<5.0	<5.0	**9.9**	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	**6.3**	<5.0	**6.0**	<5.0	<5.0	**6.7**	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**8.7**	**13**	**13**	**14**
Chloromethane	ug/L	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	**820**	**1,500**	**600**	**880**	**250**	**350**	**580**	**17**	**31**	**42**	**75**
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	**13.0**	**9.7**	**110**	<5.0	**90**	**11**	**48**	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	**7.0**	**13**	<5.0	**7.8**	**5.9**	**5.7**	**11**	**16**	**9.6**	**8.8**	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	**920**	**1,600**	**720**	**1,200**	**720**	**1,000**	**1,900**	**19**	**33**	**32**	**55**
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	**2.8**	**11**	**2.9**	**12**	**2.6**	**3.6**	**5**	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	**11**	<5.0	<5.0	<5.0	**5.1**	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	**1,767.8**	**3,148.3**	**1,443.9**	**2,112.4**	**1,068.5**	**1,370.3**	**2,565.7**	**60.7**	**86.6**	**95.8**	**144**

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		TW-2	TW-2	TW-2	TW-3	TW-3	TW-3	TW-3	TW-3	TW-3	TW-3	TW-3	TW-4	TW-4	TW-4
Date Sampled		**6/2/2016**	**11/12/2015**	**5/28/2015**	**5/15/2018**	**11/2/2017**	**5/4/2017**	**11/10/2016**	**6/3/2016**	**11/12/2015**	**6/5/2015**	**11/13/2014**	**5/15/2018**	**11/3/2017**	**5/4/2017**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150		<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	**13**	**13**	**13**	**13**	**15**	**10**	**11**	**8.6**	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	**20**	**20**	**20**	**19**	**15**	**15**	**13**	**14**	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	**13**	**18**	**14**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	**58**	**69**	**53**	**130**	**120**	**170**	**170**	**130**	**200**	**140**	**200**	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200		<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	**5.5**	**6.9**	**8.9**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	**46**	**68**	**51**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	**2**	**2.2**	**3**	**2.2**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0	<5.0
Total VOCs	ug/L	**122.5**	**161.9**	**126.9**	**163**	**155**	**205.2**	**205**	**162.2**	**225**	**164**	**222.6**	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		TW-4	TW-4	TW-4	TW-4	TW-5	TW-5	TW-5	TW-5	TW-5	TW-5	TW-5	TW-5	TW-6	TW-6
Date Sampled		**11/9/2016**	**6/3/2016**	**11/12/2015**	**5/29/2015**	**5/15/2018**	**11/3/2017**	**5/5/2017**	**11/10/2016**	**6/3/2016**	**11/16/2015**	**6/1/2015**	**11/13/2014**	**5/16/2018**	**11/6/2017**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150		<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200		<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		TW-6	TW-6	TW-6	TW-6	TW-6	TW-7	TW-7	TW-7	TW-7	TW-7	TW-7	TW-7	TW-7	TW-8
Date Sampled		**5/5/2017**	**11/11/2016**	**6/6/2016**	**11/16/2015**	**6/1/2015**	**5/16/2018**	**11/7/2017**	**5/9/2017**	**11/11/2016**	**6/6/2016**	**11/17/2015**	**6/5/2015**	**11/18/2014**	**5/16/2018**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**90**
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150		<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<5.0
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**170**
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**1,100**
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200		<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	**5.4**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	**5.4**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**1,360**

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		TW-8	TW-8	TW-8	TW-8	TW-8	TW-8	TW-9	TW-9	TW-9	TW-9	TW-9	TW-9	TW-9	TW-10
Date Sampled		**11/6/2017**	**5/8/2017**	**11/14/2016**	**6/6/2016**	**11/13/2015**	**6/2/2015**	**5/16/2018**	**11/6/2017**	**5/8/2017**	**11/14/2016**	**6/7/2016**	**11/17/2015**	**6/8/2015**	**5/17/2018**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	**14**	**82**	<5.0	**35**	**78**	**69**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<5.0	<5.0	<5.0	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	**6.1**	**270**	<5.0	**45**	**140**	**110**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	**250**	**1,600**	**80**	**420**	**810**	**550**	<5.0	**7.6**	<5.0	<5.0	<5.0	**10**	<5.0	<5.0
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	**270.1**	**1,952**	**80**	**500**	**1,028**	**729**	BDL	**7.6**	BDL	BDL	BDL	**10**	BDL	BDL

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		TW-10	TW-10	TW-10	TW-10	TW-10	TW-10	TW-11	TW-11	TW-11	TW-12	TW-12	TW-12	OW-1	OW-1
Date Sampled		**11/7/2017**	**5/9/2017**	**11/14/2016**	**6/7/2016**	**11/17/2015**	**6/8/2015**	**6/1/2016**	**11/11/2015**	**5/27/2015**	**6/1/2016**	**11/10/2015**	**5/27/2015**	**5/14/2018**	**11/8/2017**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**														
1,1,1,2-Tetrachloroethane	ug/L														
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**41**	**72**
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10	<10	<5.0	<10	<10	<5.0	<10	<10	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**41**	**72**

TABLE 5: SUMMARY OF M & J SOLVENTS SITE-SPECIFIC VOCs ANALYZED

Well		OW-1	OW-1	OW-1	OW-2	OW-2	OW-2	OW-2	OW-2	OW-3	OW-3	OW-3	OW-3	OW-3
Date Sampled		**5/10/2017**	**11/11/2016**	**6/8/2016**	**5/15/2018**	**11/8/2017**	**5/10/2017**	**11/14/2016**	**6/8/2016**	**5/15/2018**	**11/8/2017**	**5/10/2017**	**11/14/2016**	**6/8/2016**
Lithology Screened		Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil	Residual Soil
Constituent	**Units**													
1,1,1,2-Tetrachloroethane	ug/L													
1,1,1-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene (VOC)	ug/L	<5.0	<5.0	<5.0	**5.1**	**7.2**	<5.0	**6.8**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dioxane	ug/L	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150	<150
2-Butanone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzene	ug/L	<5.0	<5.0	<5.0	**9.9**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	ug/L	**54**	**57**	**47**	**300**	**230**	**100**	**220**	**22**	**15**	**33**	**19**	**18**	**14**
Chloroethane	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isobutyl Alcohol	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Isopropylbenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene (VOC)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrahydrofuran	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylenes, Total	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total VOCs	ug/L	**54**	**57**	**47**	**315**	**237.2**	**100**	**226.8**	**22**	**15**	**33**	**19**	**18**	**14**

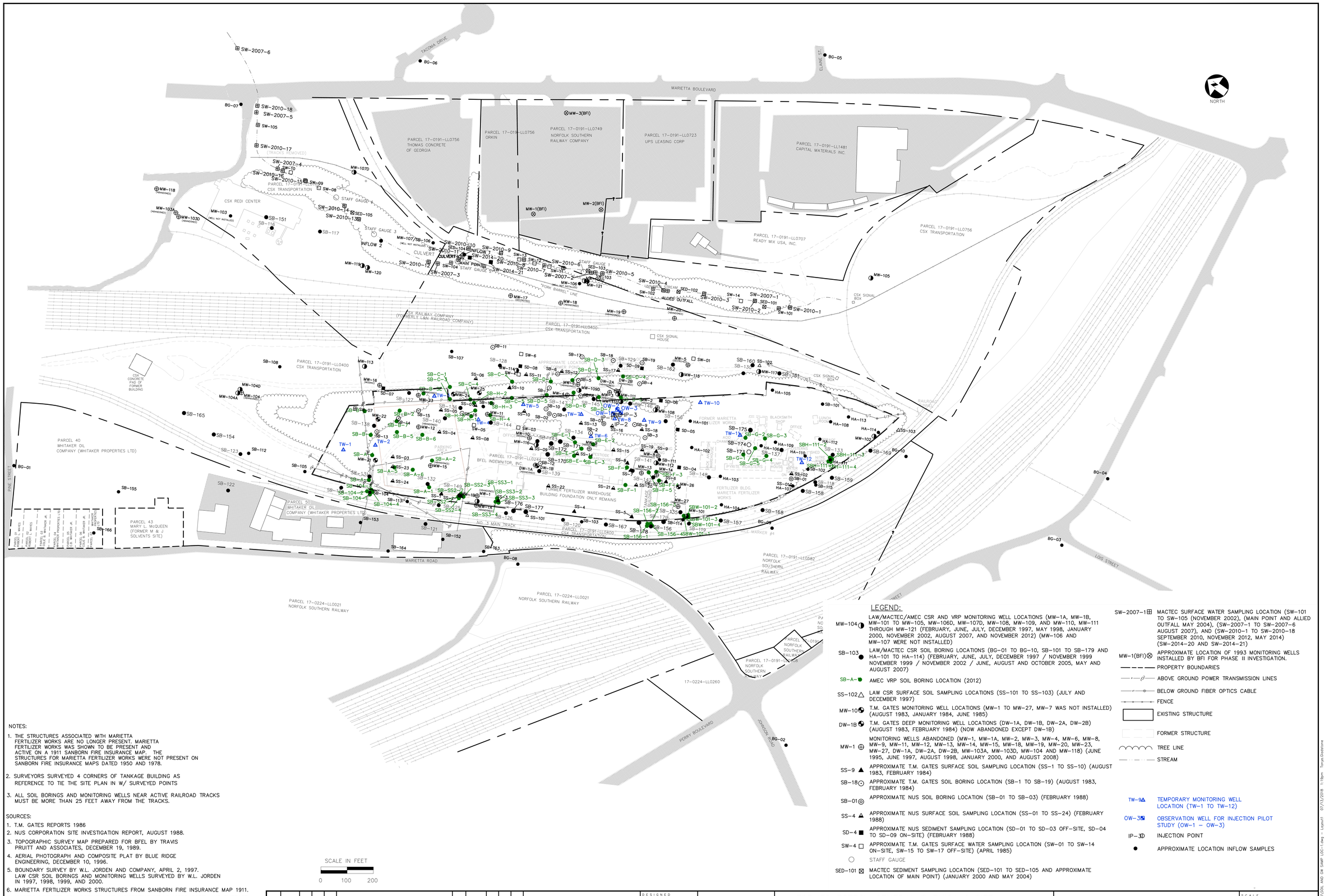
Notes
ug/L = micrograms per liter
<5.0 = constituent not detected above laboratory quantitation limit
Bolded concentrations are postive detection of constituents
VOCs = volatile organic compounds analyzed by USEPA method 8260B
BDL = below detection limit (below laboratory quantitation limit)
1,1,1,2-Tetrachloroethane has not been analyzed since September 2010

Prepared by: RNO 7/3/2018
Checked by: AS 7/6/2018

TABLE 6: SUMMARY OF HOURS INVOICED AND DESCRIPTION OF SERVICES FOR DOCUMENTATION OF PE DIRECT OVERSIGHT FOR VOLUNTARY REMEDIATION PROGRAM ACTIVITIES

	Hours Invoiced	Billing Period	Invoice # Invoice Date	Description of Services
Gregory J. Wrenn, P.E.	11.0	1/27/2018-2/23/2018	H09101108	Finalized VRP Status Report No. 12 and submitted to EPD. Conducted surveying to lay out grid for surface soil sampling. Conducted surface soil investigation, sample analysis, and initiated data management/risk assessment for Type 5 soil remedy. Addressed EPD comments to stream buffer variance.
Total Project Hours for Billing Period	377.0		3/6/2018	
Gregory J. Wrenn, P.E.	4.0	2/24/2018-3/23/2018	H09101159	Communications with CSX regarding access agreement and approval and signature of stream buffer variance. Conducted surface soil investigation sample analysis and data management.
Total Project Hours for Billing Period	7.0		4/4/2018	
Gregory J. Wrenn, P.E.	3.0	3/24/2018-4/20/2018	H09101262	Communications with CSX regarding access agreement and signature on stream buffer variance. Conducted surface soil investigation data management/mapping.
Total Project Hours for Billing Period	12.1		5/2/2018	
Gregory J. Wrenn, P.E.	9.0	4/21/2018-5/18/2018	H09101356	Data management, evaluation, and reporting for surface soil risk assessment. Submitted revised Stream Buffer Variance Application to CSX for signature. Coordinated field team and laboratory for first semi-annual 2018 water sampling event. Conducted first semi-annual groundwater and surface water sampling event in May 2018, including additional VOC sampling and analysis to evaluate impacts from M&J Solvents site.
Total Project Hours for Billing Period	376.3		6/4/2018	
Gregory J. Wrenn, P.E.	2.0	5/19/2018 to 6/15/2018	H09101416	Prepared surface soil human health and ecological receptor risk assessment reports. Data management and validation and reporting for August 2018 VRP Status Report.
Total Project Hours for Billing Period	191.7		6/22/2018	
Total Hours for PE Gregory J. Wrenn	**29.0**			
Total Project Hours	**964.1**			

FIGURES



NOTES:

1. THE STRUCTURES ASSOCIATED WITH MARIETTA FERTILIZER WORKS ARE NO LONGER PRESENT. MARIETTA FERTILIZER WORKS WAS SHOWN TO BE PRESENT AND ACTIVE ON A 1911 SANBORN FIRE INSURANCE MAP. THE STRUCTURES FOR MARIETTA FERTILIZER WORKS WERE NOT PRESENT ON SANBORN FIRE INSURANCE MAPS DATED 1950 AND 1978.
2. SURVEYORS SURVEYED 4 CORNERS OF TANKAGE BUILDING AS REFERENCE TO TIE THE SITE PLAN IN W/ SURVEYED POINTS
3. ALL SOIL BORINGS AND MONITORING WELLS NEAR ACTIVE RAILROAD TRACKS MUST BE MORE THAN 25 FEET AWAY FROM THE TRACKS.

SOURCES:

1. T.M. GATES REPORTS 1986
2. NUS CORPORATION SITE INVESTIGATION REPORT, AUGUST 1988.
3. TOPOGRAPHIC SURVEY MAP PREPARED FOR BFEL BY TRAVIS PRUITT AND ASSOCIATES, DECEMBER 19, 1989.
4. AERIAL PHOTOGRAPH AND COMPOSITE PLAT BY BLUE RIDGE ENGINEERING, DECEMBER 10, 1996.
5. BOUNDARY SURVEY BY W.L. JORDEN AND COMPANY, APRIL 2, 1997. LAW CSR SOIL BORINGS AND MONITORING WELLS SURVEYED BY W.L. JORDEN IN 1997, 1998, 1999, AND 2000.
6. MARIETTA FERTILIZER WORKS STRUCTURES FROM SANBORN FIRE INSURANCE MAP 1911.
7. MACTEC/LAW CSR SOIL BORINGS AND MONITORING WELLS (2002–2007) AND SURFACE WATER LOCATIONS SURVEYED BY MACTEC ENGINEERING AND CONSULTING INC.
8. PROPERTY OWNERS SHOWN ARE BASED ON 1996 FULTON COUNTY TAX RECORDS
9. WHITAKER AND MARY L. McQUEEN PROPERTY BOUNDARIES WERE REVISED AND ARE APPROXIMATE AND ARE BASED ON FULTON COUNTY BOARD OF ASSESSORS RECORDS 2004–2005 AT www.fultonassessor.org

CADD NOTE: DRAWING XREFS ROTATED @ 0,0; 55° FROM SURVEY FILE COORDINATE POSITION.

SCALE IN FEET
0 100 200

LEGEND:

- MW-104 — LAW/MACTEC/AMEC CSR AND VRP MONITORING WELL LOCATIONS (MW-1A, MW-1B, MW-101 TO MW-105, MW-106D, MW-107D, MW-108, MW-109, AND MW-110, MW-111 THROUGH MW-121 (FEBRUARY, JUNE, JULY, DECEMBER 1997, MAY 1998, JANUARY 2000, NOVEMBER 2002, AUGUST 2007, AND NOVEMBER 2012) (MW-106 AND MW-107 WERE NOT INSTALLED)
- SB-103 — LAW/MACTEC CSR SOIL BORING LOCATIONS (BG-01 TO BG-10, SB-101 TO SB-179 AND HA-101 TO HA-114) (FEBRUARY, JUNE, JULY, DECEMBER 1997 / NOVEMBER 1999 NOVEMBER 1999 / NOVEMBER 2002 / JUNE, AUGUST AND OCTOBER 2005, MAY AND AUGUST 2007)
- SB-A- — AMEC VRP SOIL BORING LOCATION (2012)
- SS-102 — LAW CSR SURFACE SOIL SAMPLING LOCATIONS (SS-101 TO SS-103) (JULY AND DECEMBER 1997)
- MW-10 — T.M. GATES MONITORING WELL LOCATIONS (MW-1 TO MW-27, MW-7 WAS NOT INSTALLED) (AUGUST 1983, JANUARY 1984, JUNE 1985)
- DW-1B — T.M. GATES DEEP MONITORING WELL LOCATIONS (DW-1A, DW-1B, DW-2A, DW-2B) (AUGUST 1983, FEBRUARY 1984) (NOW ABANDONED EXCEPT DW-1B)
- MW-1 — MONITORING WELLS ABANDONED (MW-1, MW-1A, MW-2, MW-3, MW-4, MW-6, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-23, MW-27, DW-1A, DW-2A, DW-2B, MW-103A, MW-103D, MW-104 AND MW-118) (JUNE 1995, JUNE 1997, AUGUST 1998, JANUARY 2000, AND AUGUST 2008)
- SS-9 — APPROXIMATE T.M. GATES SURFACE SOIL SAMPLING LOCATION (SS-1 TO SS-10) (AUGUST 1983, FEBRUARY 1984)
- SB-18 — APPROXIMATE T.M. GATES SOIL BORING LOCATION (SB-1 TO SB-19) (AUGUST 1983, FEBRUARY 1984)
- SB-01 — APPROXIMATE NUS SOIL BORING LOCATION (SB-01 TO SB-03) (FEBRUARY 1988)
- SS-4 — APPROXIMATE NUS SURFACE SOIL SAMPLING LOCATION (SS-01 TO SS-24) (FEBRUARY 1988)
- SD-4 — APPROXIMATE NUS SEDIMENT SAMPLING LOCATION (SD-01 TO SD-03 OFF-SITE, SD-04 TO SD-09 ON-SITE) (FEBRUARY 1988)
- SW-4 — APPROXIMATE T.M. GATES SURFACE WATER SAMPLING LOCATION (SW-01 TO SW-14 ON-SITE, SW-15 TO SW-17 OFF-SITE) (APRIL 1985)
- STAFF GAUGE
- SED-101 — MACTEC SEDIMENT SAMPLING LOCATION (SED-101 TO SED-105 AND APPROXIMATE LOCATION OF MAIN POINT) (JANUARY 2000 AND MAY 2004)
- SW-2007-1 — MACTEC SURFACE WATER SAMPLING LOCATION (SW-101 TO SW-105 (NOVEMBER 2002), (MAIN POINT AND ALLIED OUTFALL MAY 2004), (SW-2007-1 TO SW-2007-6 AUGUST 2007), AND (SW-2010-1 TO SW-2010-18 SEPTEMBER 2010, NOVEMBER 2012, MAY 2014) (SW-2014-20 AND SW-2014-21)
- MW-1(BFI) — APPROXIMATE LOCATION OF 1993 MONITORING WELLS INSTALLED BY BFI FOR PHASE II INVESTIGATION.
- PROPERTY BOUNDARIES
- ABOVE GROUND POWER TRANSMISSION LINES
- BELOW GROUND FIBER OPTICS CABLE
- FENCE
- EXISTING STRUCTURE
- FORMER STRUCTURE
- TREE LINE
- STREAM
- TW-9 — TEMPORARY MONITORING WELL LOCATION (TW-1 TO TW-12)
- OW-3 — OBSERVATION WELL FOR INJECTION PILOT STUDY (OW-1 – OW-3)
- IP-3 — INJECTION POINT
- APPROXIMATE LOCATION INFLOW SAMPLES

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED: A. SHOREDITS
DRAWN: T. GLADSTONE
CHECKED: R. QUINN
IN CHARGE: G. WRENN
DATE: 7/9/2018

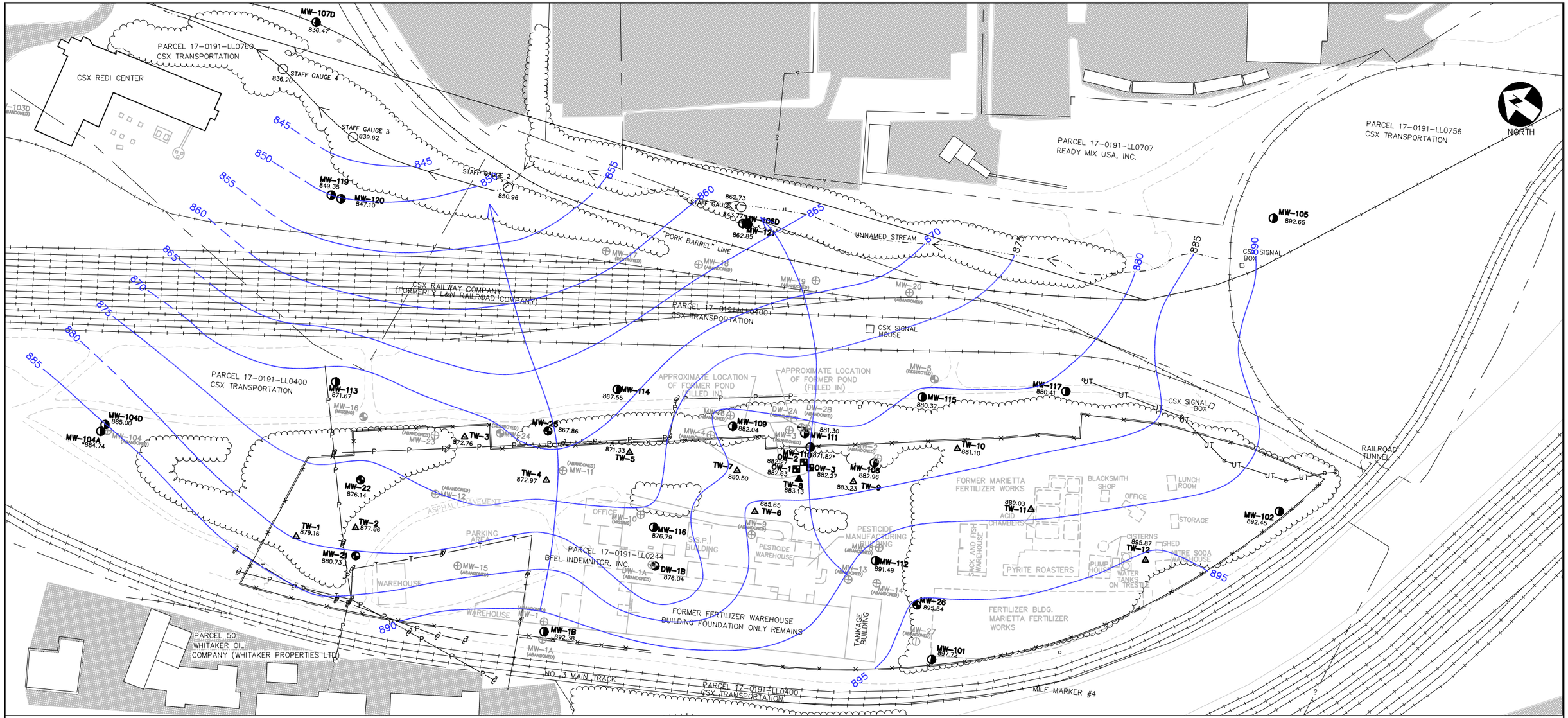
FORMER ESTECH GENERAL CHEMICALS SITE
ATLANTA, GEORGIA

wood.
ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

SOIL AND GROUNDWATER SAMPLING LOCATIONS

SCALE: AS SHOWN
CONTRACT: 6122-08-0154
DWG. NO.: 1
REV:
PAGE NO.:

I:\BFEL_ATLANTA\ANNUAL 2018\SOIL AND GW SAMP LOC - Dwg - Layout1 07/13/2018 1:19pm Tanya.Gladstone



NOTES:

1. THE STRUCTURES ASSOCIATED WITH MARIETTA FERTILIZER WORKS ARE NO LONGER PRESENT. MARIETTA FERTILIZER WORKS WAS SHOWN TO BE PRESENT AND ACTIVE ON A 1911 SANBORN FIRE INSURANCE MAP. THE STRUCTURES FOR MARIETTA FERTILIZER WORKS WERE NOT PRESENT ON SANBORN FIRE INSURANCE MAPS DATED 1950 AND 1978.
2. SURVEYORS SURVEYED 4 CORNERS OF TANKAGE BUILDING AS REFERENCE TO TIE THE SITE PLAN IN W/ SURVEYED POINTS.
3. ALL SOIL BORINGS AND MONITORING WELLS NEAR ACTIVE RAILROAD TRACKS MUST BE AT LEAST 25 FEET AWAY FROM THE TRACKS.

SOURCES:

1. T.M. GATES REPORTS 1986
2. NUS CORPORATION SITE INVESTIGATION REPORT, AUGUST 1988.
3. TOPOGRAPHIC SURVEY MAP PREPARED FOR BFEL BY TRAVIS PRUITT AND ASSOCIATES, DECEMBER 19, 1989.
4. AERIAL PHOTOGRAPH AND COMPOSITE PLAT BY BLUE RIDGE ENGINEERING, DECEMBER 10, 1996.
5. BOUNDARY SURVEY BY W.L. JORDEN AND COMPANY, APRIL 2, 1997. LAW CSR SOIL BORINGS AND MONITORING WELLS SURVEYED BY W.L. JORDEN IN 1997, 1998, 1999, AND 2000.
6. MARIETTA FERTILIZER WORKS STRUCTURES FROM SANBORN FIRE INSURANCE MAP 1911.
7. AMEC/MACTEC/LAW CSR AND VRP SOIL BORINGS AND MONITORING WELLS (2002-2012) AND SURFACE WATER LOCATIONS SURVEYED BY MACTEC ENGINEERING AND CONSULTING INC. AND AMEC.
8. PROPERTY OWNERS SHOWN ARE BASED ON 1996 FULTON COUNTY TAX RECORDS.
9. WHITAKER AND MARY L. McQUEEN PROPERTY BOUNDARIES WERE REVISED AND ARE APPROXIMATE AND ARE BASED ON FULTON COUNTY BOARD OF ASSESSORS RECORDS 2004-2005 AT www.fultonassessor.org

CADD NOTE: DRAWING XREFS ROTATED @ 0,0; 55° FROM SURVEY FILE COORDINATE POSITION.

LEGEND:

- MW-104 — LAW/MACTEC/AMEC/ CSR AND VRP MONITORING WELL LOCATIONS (MW-1A, MW-1B, MW-101 TO MW-105, MW-106D, MW-107D, MW-108, MW-109, AND MW-110, MW-111 THROUGH MW-121 (FEBRUARY, JUNE, JULY, DECEMBER 1997, MAY 1998, JANUARY 2000, NOVEMBER 2002, AND AUGUST 2007, AND NOVEMBER-DECEMBER 2012, (MW-106 AND MW-107 WERE NOT INSTALLED)
- MW-10 — T.M. GATES MONITORING WELL LOCATIONS (MW-1 TO MW-27, MW-7 WAS NOT INSTALLED) (AUGUST 1983, JANUARY 1984, JUNE 1985)
- DW-1B — T.M. GATES DEEP MONITORING WELL LOCATIONS (DW-1A, DW-1B, DW-2A, DW-2B) (AUGUST 1983, FEBRUARY 1984)
- TW-10 — TEMPORARY MONITORING WELL LOCATIONS (TW-1 THROUGH TW-12) (MAY 2012) AND (OW-1 THROUGH OW-3) (JANUARY 2013)
- MW-19 — MONITORING WELLS ABANDONED (MW-1, MW-1A, MW-2, MW-3, MW-4, MW-6, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-23, MW-27, DW-1A, DW-2A, DW-2B, AND MW-104) (JUNE 1995, JUNE 1997, AUGUST 1998, JANUARY 2000, AUGUST 2007). MW-103A, MW-103D AND MW-118 ABANDONED BY CSX, FEBRUARY 2008.

- EXISTING STRUCTURE
- FORMER STRUCTURE
- TREE LINE
- STREAM
- STREAM GAUGE
- PROPERTY BOUNDARIES
- ABOVEGROUND POWER TRANSMISSION LINES
- BELOWGROUND FIBER OPTICS CABLE
- FENCE
- 890 — POTENTIOMETRIC SURFACE CONTOUR (FEET, NGVD)
- INTERPRETED GROUND-WATER FLOW DIRECTION
- 897.72 — GROUNDWATER ELEVATION (FEET, NGVD)
- *843.77 — GROUNDWATER ELEVATIONS IN WELLS NOT USED TO CALCULATE POTENTIOMETRIC SURFACE

SCALE IN FEET
0 100 200

DESIGNED	A. SHOREDITS
DRAWN	T. GLADSTONE
CHECKED	R. QUINN
IN CHARGE	G. WRENN
DATE	6/26/2018

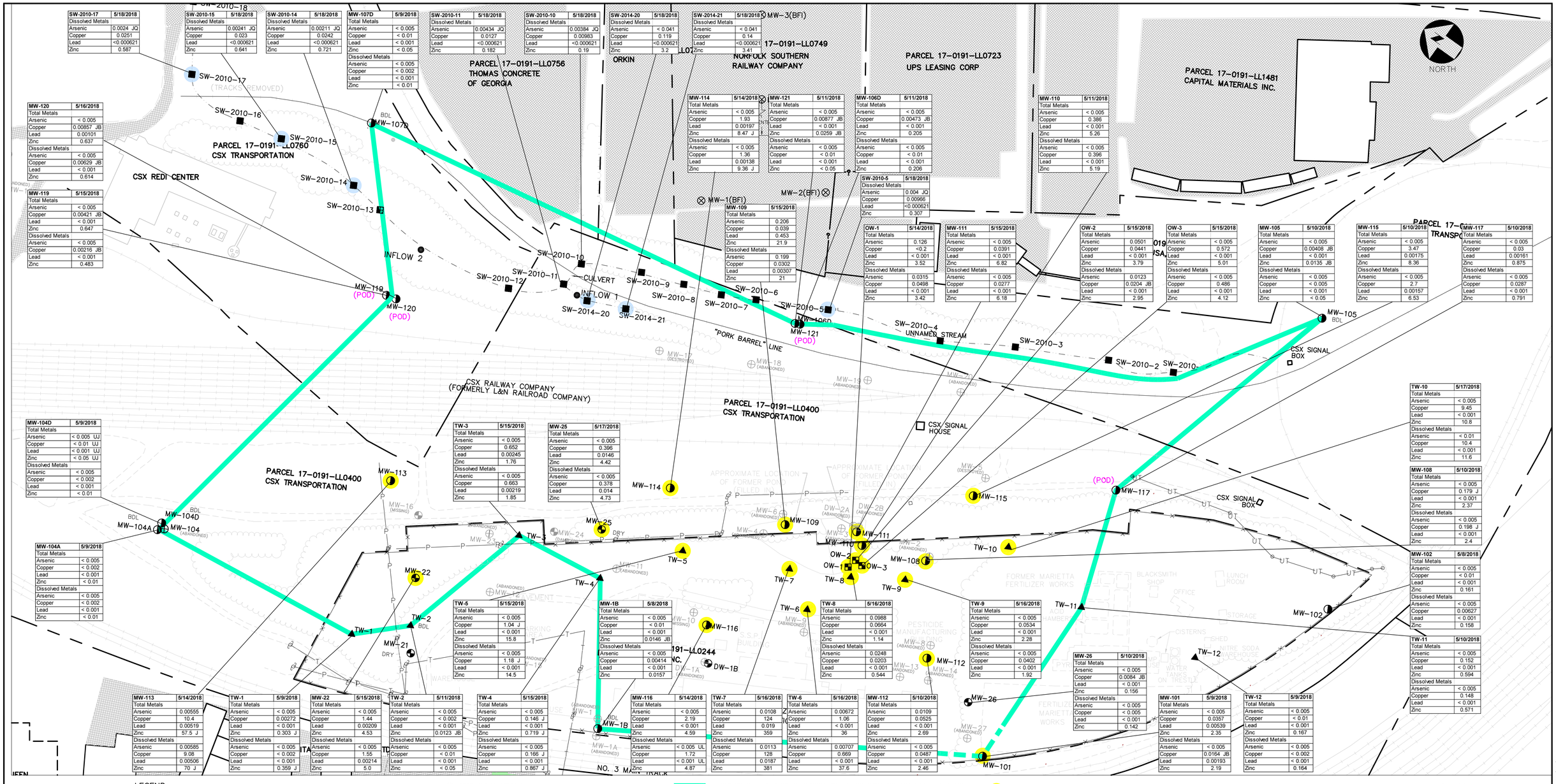
FORMER ESTECH GENERAL CHEMICALS SITE

ATLANTA, GEORGIA

wood.
ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

POTENTIOMETRIC SURFACE MAY 2018

SCALE	AS SHOWN
CONTRACT	6122-08-0154
DWG. NO.	FIG 2
REV	
PAGE NO	



DESIGNED	A. SHOREDITS
DRAWN	T. GLADSTONE
CHECKED	R. QUINN
IN CHARGE	G. WRENN
DATE	8/1/2018

FORMER ESTECH GENERAL CHEMICALS SITE

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ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

DISTRIBUTION AND DELINEATION OF ARSENIC, LEAD, COPPER AND ZINC DETECTED IN GROUND WATER

SCALE	AS SHOWN
CONTRACT	6122-08-0154
DWG. NO.	3
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PAGE NO.	

J:\BFEL ATLANTA\JUNE 2018\DELINEATION OF LEAD COPPER ZINC.dwg — Layout1 08/02/2018 3:10pm Tonya.Gladstone

SW-2010-17	5/18/2018
alpha-BHC	0.0002 JH
beta-BHC	0.0003 JH
delta-BHC	0.00021 JH
gamma-BHC	0.000091 JH

SW-2010-15	5/18/2018
alpha-BHC	0.0002 JH
beta-BHC	0.0003 JH
delta-BHC	0.00021 JH
gamma-BHC	0.000084 JH

SW-2010-14	5/18/2018
alpha-BHC	0.00026
beta-BHC	0.00036
delta-BHC	0.00016
Dieldrin	0.0000083 JQ
gamma-BHC	0.0001

SW-2010-11	5/18/2018
alpha-BHC	0.00012
beta-BHC	0.000046 JQ
delta-BHC	0.00005 JQ
gamma-BHC	0.00007

SW-2010-10	5/18/2018
alpha-BHC	0.00012 JH
beta-BHC	0.00016 JH
gamma-BHC	0.000074 JH

SW-2014-20	5/18/2018
alpha-BHC	0.00018
beta-BHC	0.0011
delta-BHC	0.0001
Dieldrin	0.000023 JQ
gamma-BHC	0.00011

SW-2014-21	5/18/2018
alpha-BHC	0.00014
beta-BHC	0.0012
delta-BHC	0.0001
Dieldrin	0.00003 JQ
gamma-BHC	0.000091

SW-2010-5	5/18/2018
alpha-BHC	0.000052
beta-BHC	0.000033 JQ
delta-BHC	0.000024 JQ
gamma-BHC	0.000035 JQ

MW-121	5/11/2018
alpha-BHC	0.00014
beta-BHC	0.0001
delta-BHC	0.00011

MW-106D	5/11/2018
alpha-BHC	0.00063
beta-BHC	0.00023
delta-BHC	0.00066
gamma-BHC	0.00038

MW-119	5/15/2018
alpha-BHC	0.00045
beta-BHC	0.00034
delta-BHC	0.00038
gamma-BHC	0.000053

MW-120	5/16/2018
alpha-BHC	0.0013
beta-BHC	0.0015
delta-BHC	0.0012
gamma-BHC	0.00016

MW-114	5/14/2018
alpha-BHC	0.00019
beta-BHC	0.0013
delta-BHC	0.000082
gamma-BHC	0.000086

MW-113	5/14/2018
alpha-BHC	0.0001 JL
beta-BHC	0.00039 JL
delta-BHC	0.000096 JL
gamma-BHC	0.00015 JL

MW-22	5/15/2018
alpha-BHC	0.00012
beta-BHC	0.00052
delta-BHC	0.000072
gamma-BHC	0.00018

TW-1	5/9/2018
4,4'-DDD	0.0006
4,4'-DDE	0.0006
4,4'-DDT	0.00038
alpha-BHC	0.00032
beta-BHC	0.0039
delta-BHC	0.00027
gamma-BHC	0.00024

TW-3	5/15/2018
alpha-BHC	0.0017
beta-BHC	0.0014
delta-BHC	0.00043
gamma-BHC	0.00067

MW-25	5/17/2018
alpha-BHC	0.000082
beta-BHC	0.0034
delta-BHC	0.00011

TW-4	5/15/2018
beta-BHC	0.0028

TW-5	5/15/2018
alpha-BHC	0.000078
beta-BHC	0.0006
gamma-BHC	0.00011

MW-116	5/14/2018
beta-BHC	0.0002

TW-7	5/16/2018
alpha-BHC	0.00096 JH
beta-BHC	0.0027 JH
delta-BHC	0.00097 JH
gamma-BHC	0.00099 JH

TW-6	5/16/2018
alpha-BHC	0.0018
beta-BHC	0.0021
delta-BHC	0.00047
gamma-BHC	0.00067

MW-110	5/11/2018
alpha-BHC	0.00042
beta-BHC	0.00052
delta-BHC	0.0007
gamma-BHC	0.00043

MW-111	5/15/2018
alpha-BHC	0.032
beta-BHC	0.0067
delta-BHC	0.054
Dieldrin	0.00012
gamma-BHC	0.036

MW-109	5/15/2018
alpha-BHC	0.045
beta-BHC	0.0039
delta-BHC	0.0037
gamma-BHC	0.026

OW-1	5/14/2018
alpha-BHC	0.00081
beta-BHC	0.00035
delta-BHC	0.015
gamma-BHC	0.0006

OW-2	5/15/2018
alpha-BHC	0.027
beta-BHC	0.0054
delta-BHC	0.072
gamma-BHC	0.018

OW-3	5/15/2018
alpha-BHC	0.0038
beta-BHC	0.002
delta-BHC	0.0097
gamma-BHC	0.002

MW-115	5/10/2018
alpha-BHC	0.00025
beta-BHC	0.00029

MW-108	5/10/2018
4,4'-DDD	0.00014
alpha-BHC	0.00067
beta-BHC	0.0015
delta-BHC	0.0001
gamma-BHC	0.00029

TW-9	5/16/2018
4,4'-DDT	0.0002
alpha-BHC	0.0048
beta-BHC	0.009
delta-BHC	0.0035
Dieldrin	0.00019
gamma-BHC	0.0015
Heptachlor	0.00017

MW-112	5/10/2018
alpha-BHC	0.00084
beta-BHC	0.00024
gamma-BHC	0.00018

MW-26	5/10/2018
alpha-BHC	0.000052
beta-BHC	0.00058
delta-BHC	0.000058

TW-8	5/16/2018
4,4'-DDD	0.0036
4,4'-DDT	0.013 J
alpha-BHC	0.74
beta-BHC	0.078
delta-BHC	2
Dieldrin	0.004
gamma-BHC	1.7
gamma-Chlordane	0.00079

LEGEND:

LAW/MACTEC/AMEC CSR AND VRP MONITORING WELL LOCATIONS (MW-1A, MW-1B, MW-101 TO MW-105, MW-104A, MW-104D, MW-106D, MW-107D, MW-108, MW-109, AND MW-110, MW-111 THROUGH MW-121 (FEBRUARY, JUNE, JULY, DECEMBER 1997, MAY 1998, JANUARY 2000, NOVEMBER 2002, AUGUST 2007, AND NOVEMBER 2012) (MW-106 AND MW-107 WERE NOT INSTALLED)

T.M. GATES MONITORING WELL LOCATIONS (MW-1 TO MW-27, MW-7 WAS NOT INSTALLED) (AUGUST 1983, JANUARY 1984, JUNE 1985)

T.M. GATES DEEP MONITORING WELL LOCATIONS (DW-1A, DW-1B, DW-2A, DW-2B) (AUGUST 1983, FEBRUARY 1984)

MONITORING WELLS ABANDONED (MW-1, MW-1A, MW-2, MW-3, MW-4, MW-6, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-23, MW-27, DW-1A, DW-2A, DW-2B, AND MW-104) (JUNE 1995, JUNE 1997, AUGUST 1998, JANUARY 2000, AND AUGUST 2007)
CSX ABANDONED WELLS MW-103A, MW-103D AND MW-118

INFLOW 1 — SEEP ALONG STREAM

SW-2010-1 — MACTEC/AMEC SURFACE WATER SAMPLING LOCATIONS (SW-2010-1 TO SW-2010-18, SW-2014-20 AND SW-2014-21)

MW-1(BFI) — APPROXIMATE LOCATION OF MONITORING WELLS INSTALLED FOR 1993 DUE PHASE II INVESTIGATION.

TW-1 — TEMPORARY WELLS (MAY 2012)

POD — POINT OF DEMONSTRATION WELL

BDL — BELOW DETECTION LIMIT

PROPERTY BOUNDARIES

ABOVEGROUND POWER TRANSMISSION LINES

BELOWGROUND FIBER OPTICS CABLE

FENCE

EXISTING STRUCTURE

FORMER STRUCTURE

TREE LINE

STREAM

PESTICIDES, IN GROUND WATER ARE DELINEATED PER THE VRP DELINEATION CRITERIA 12-8-108(E) DEFAULT RESIDENTIAL CLEANUP STANDARDS (TYPE I RRS).

GROUNDWATER CONCENTRATION IS GREATER THAN TYPE I RRS

SURFACE WATER CONCENTRATION IS GREATER THAN GEORGIA INSTREAM WATER QUALITY CRITERIA (HUMAN HEALTH CRITERIA FOR ALPHA AND BETA BHC)

HORIZONTAL DELINEATION OF GROUNDWATER CONTAMINATION BASED ON TYPE I RRS

OBSERVATION WELL FOR PILOT INJECTION STUDY

ALL CONCENTRATIONS EXPRESSED IN MILLIGRAMS PER LITER (MG/L)

J = ESTIMATED BASED ON QC CRITERIA
JH = ESTIMATED, POSSIBLY BIASED HIGH
JL = ESTIMATED, POSSIBLY BIASED LOW
JQ = ESTIMATED, DETECTED BETWEEN THE METHOD DETECTION LIMIT (MDL) AND THE REPORTING LIMIT (RL)
* INSUFFICIENT WATER TO SAMPLE WELL

SCALE IN FEET
0 100 200

DESIGNED	A. SHOREDITS
DRAWN	T. GLADSTONE
CHECKED	R. QUINN
IN CHARGE	G. WRENN
DATE	8/1/2018

FORMER ESTECH GENERAL CHEMICALS SITE

ATLANTA, GEORGIA

wood.
ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.
1075 BIG SHANTY ROAD, NW, SUITE 100
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DISTRIBUTION AND DELINEATION OF PESTICIDES DETECTED IN GROUND WATER

SCALE	AS SHOWN
CONTRACT	6122-08-0154
DWG. NO.	4
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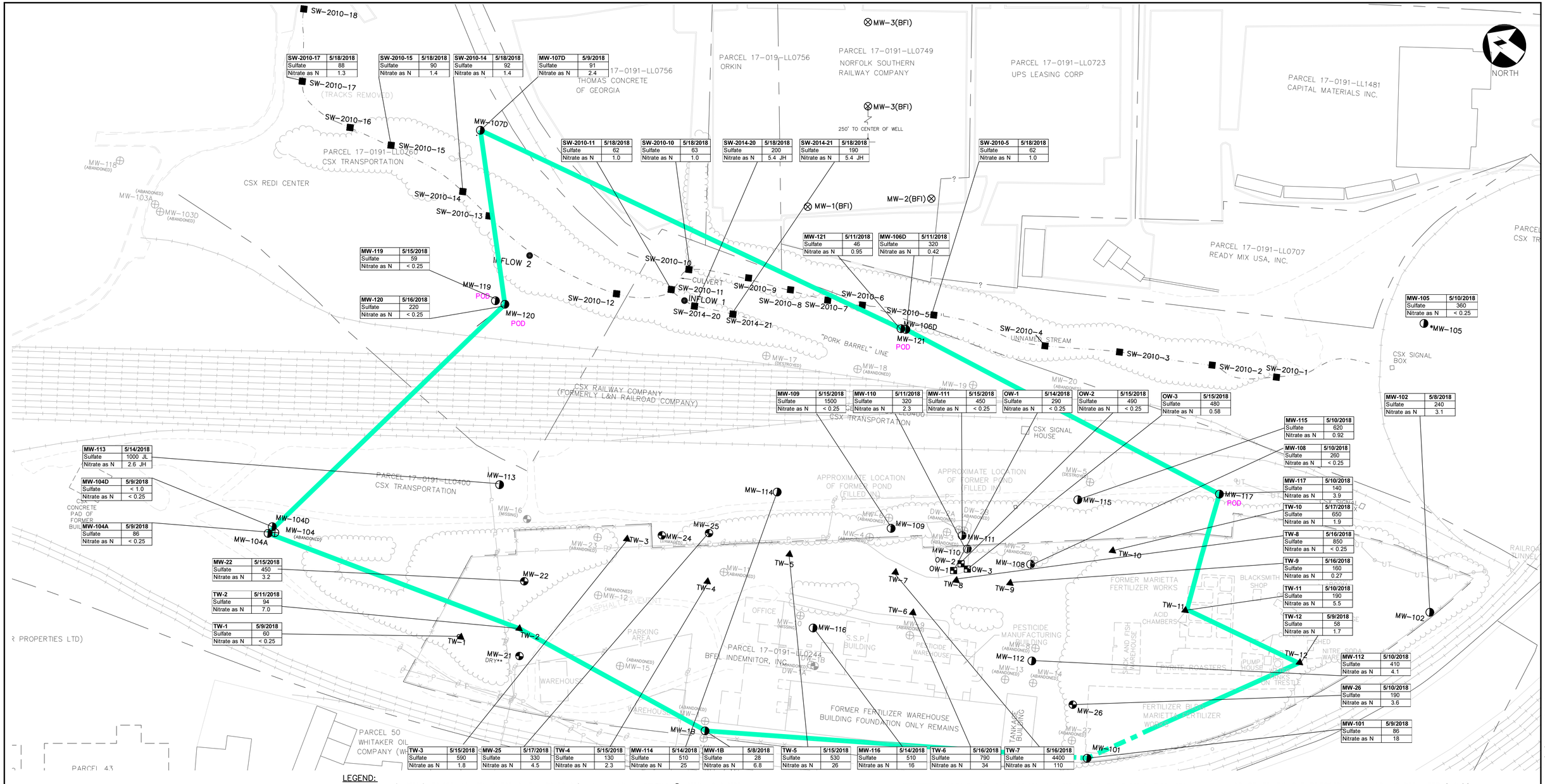
PAGE NO	

J:\BFEL ATLANTA\JUNE 2018\DISTRIBUTION AND DELIN OF PESTICIDES.dwg - Layout1 08/02/2018 3:12pm Tonya.Gladstone



LEGEND:

- MW-104 ◑ LAW/MACTEC/AMEC CSR AND VRP MONITORING WELL LOCATIONS (MW-1A, MW-1B, MW-101 TO MW-105, MW-103D, MW-104A, MW-104D, MW-106D, MW-107D, MW-108, MW-109, AND MW-110, MW-111 THROUGH MW-121 (FEBRUARY, JUNE, JULY, DECEMBER 1997, MAY 1998, JANUARY 2000, NOVEMBER 2002, AUGUST 2007, AND NOVEMBER 2012) (MW-106 AND MW-107 WERE NOT INSTALLED)
- MW-10 ◔ T.M. GATES MONITORING WELL LOCATIONS (MW-1 TO MW-27, MW-7 WAS NOT INSTALLED) (AUGUST 1983, JANUARY 1984, JUNE 1985)
- DW-1B ◔ T.M. GATES DEEP MONITORING WELL LOCATIONS (DW-1A, DW-1B, DW-2A, DW-2B) (AUGUST 1983, FEBRUARY 1984)
- MW-1 ⊕ MONITORING WELLS ABANDONED (MW-1, MW-1A, MW-2, MW-3, MW-4, MW-6, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-23, MW-27, DW-1A, DW-2A, DW-2B, AND MW-104) (JUNE 1995, JUNE 1997, AUGUST 1998, JANUARY 2000, AND AUGUST 2007) CSX ABANDONED WELLS, MW-103A, MW-103D AND MW-118
- TW-1 ▲ TEMPORARY WELLS (MAY 2012)
- INFLOW 1 ● SEEP ALONG STREAM
- OW-1 ◪ OBSERVATION WELL FOR PILOT INJECTION STUDY
- SW-2010-1 ■ MACTEC/AMEC SURFACE WATER SAMPLING LOCATIONS (SW-2010-1 TO SW-2010-18, SW-2014-20 AND SW-2014-21)
- MW-1(BFI) ⊗ APPROXIMATE LOCATION OF MONITORING WELLS INSTALLED FOR 1993 DUE PHASE II INVESTIGATION.

NITRATE AND SULFATE IN GROUNDWATER ARE DELINEATED PER THE VRP DELINEATION CRITERIA 12-8-108(E) DEFAULT RESIDENTIAL CLEANUP STANDARDS (TYPE I RRS)

NITRATE 10 MG/L (NON-REGULATED)
SULFATE 250 MG/L (NON-REGULATED)

POD POINT OF DEMONSTRATION WELL

HORIZONTAL DELINEATION OF GROUND-WATER CONTAMINATION BASED ON TYPE I RRS

PROPERTY BOUNDARIES
ABOVEGROUND POWER TRANSMISSION LINES
BELOWGROUND FIBER OPTICS CABLE
FENCE
EXISTING STRUCTURE
FORMER STRUCTURE
TREE LINE
STREAM

ALL CONCENTRATIONS EXPRESSED IN MILLIGRAMS PER LITER (MG/L)

ALL CONCENTRATIONS EXPRESSED IN MILLIGRAMS PER LITER (MG/L)

JH ESTIMATED, POSSIBLY BIASED HIGH
JL ESTIMATED, POSSIBLY BIASED LOW
< NOT DETECTED ABOVE THE ASSOCIATED REPORTING LIMIT
** INSUFFICIENT WATER TO SAMPLE WELL

SCALE IN FEET
0 100 200

DESIGNED	A. SHOREDITS
DRAWN	T. GLADSTONE
CHECKED	R. QUINN
IN CHARGE	G. WRENN
DATE	8/1/2018

FORMER ESTECH GENERAL CHEMICALS SITE

ATLANTA, GEORIGA

wood.
ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.
1075 BIG SHANTY ROAD, NW, SUITE 100
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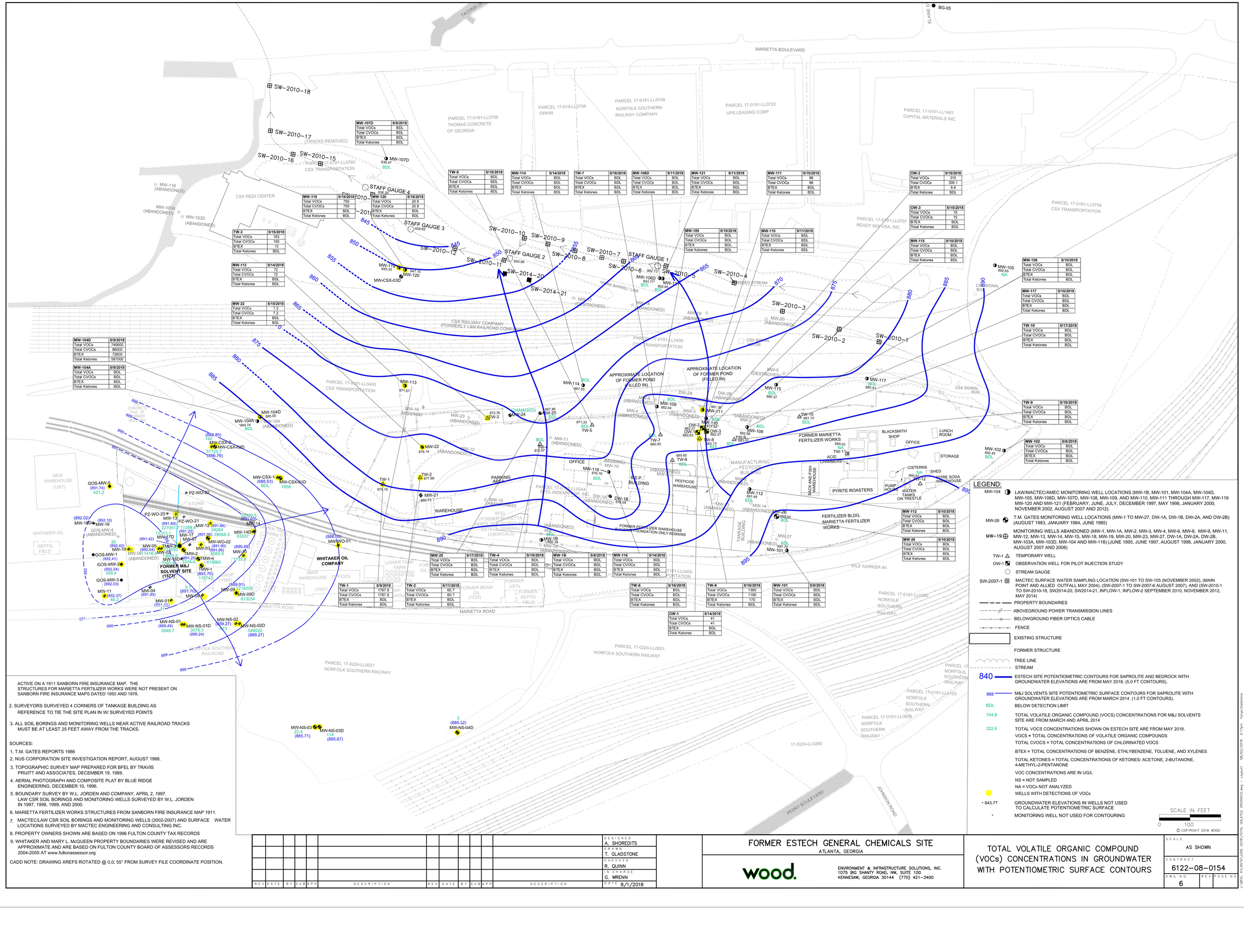
DISTRIBUTION AND DELINEATION OF NITRATE AND SULFATE IN GROUND WATER

SCALE	AS SHOWN
CONTRACT	6122-08-0154
DWG. NO.	5
REV	
PAGE NO	

J:\BFEL ATLANTA\JUNE 2018\DELINEATION OF NITRATE AND SULFATE.dwg - Layout1 08/02/2018 3:08pm Tonya.Gladstone



MW-107D	5/9/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-119	5/15/2018
Total VOCs	750
Total CVOCs	750
BTEX	BDL
Total Ketones	BDL

MW-120	5/16/2018
Total VOCs	20.8
Total CVOCs	20.8
BTEX	BDL
Total Ketones	BDL

TW-3	5/15/2018
Total VOCs	163
Total CVOCs	150
BTEX	13
Total Ketones	BDL

MW-113	5/14/2018
Total VOCs	72
Total CVOCs	72
BTEX	BDL
Total Ketones	BDL

MW-22	5/15/2018
Total VOCs	7.2
Total CVOCs	7.2
BTEX	BDL
Total Ketones	BDL

MW-104D	5/9/2018
Total VOCs	745600
Total CVOCs	86000
BTEX	72600
Total Ketones	587000

MW-104A	5/9/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-5	5/15/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-114	5/14/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-7	5/16/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-106D	5/11/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-121	5/11/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-111	5/15/2018
Total VOCs	96
Total CVOCs	96
BTEX	BDL
Total Ketones	BDL

OW-2	5/15/2018
Total VOCs	315
Total CVOCs	305.1
BTEX	9.9
Total Ketones	BDL

OW-3	5/15/2018
Total VOCs	15
Total CVOCs	15
BTEX	BDL
Total Ketones	BDL

MW-109	5/15/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-110	5/11/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-115	5/10/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-108	5/10/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-117	5/10/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-10	5/17/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-9	5/16/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-102	5/8/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-112	5/10/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-26	5/10/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-25	5/17/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-4	5/15/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-18	5/8/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

MW-116	5/14/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-1	5/9/2018
Total VOCs	1767.8
Total CVOCs	1767.8
BTEX	BDL
Total Ketones	BDL

TW-2	5/11/2018
Total VOCs	60.7
Total CVOCs	60.7
BTEX	BDL
Total Ketones	BDL

TW-6	5/16/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

TW-8	5/16/2018
Total VOCs	1360
Total CVOCs	1190
BTEX	170
Total Ketones	BDL

MW-101	5/9/2018
Total VOCs	BDL
Total CVOCs	BDL
BTEX	BDL
Total Ketones	BDL

OW-1	5/14/2018
Total VOCs	41
Total CVOCs	41
BTEX	BDL
Total Ketones	BDL

ACTIVE ON A 1911 SANBORN FIRE INSURANCE MAP. THE STRUCTURES FOR MARIETTA FERTILIZER WORKS WERE NOT PRESENT ON SANBORN FIRE INSURANCE MAPS DATED 1950 AND 1978.

2. SURVEYORS SURVEYED 4 CORNERS OF TANKAGE BUILDING AS REFERENCE TO TIE THE SITE PLAN IN W/ SURVEYED POINTS

3. ALL SOIL BORINGS AND MONITORING WELLS NEAR ACTIVE RAILROAD TRACKS MUST BE AT LEAST 25 FEET AWAY FROM THE TRACKS.

SOURCES:

1. T.M. GATES REPORTS 1986
2. NUS CORPORATION SITE INVESTIGATION REPORT, AUGUST 1988.
3. TOPOGRAPHIC SURVEY MAP PREPARED FOR BFEL BY TRAVIS PRUITT AND ASSOCIATES, DECEMBER 19, 1989.
4. AERIAL PHOTOGRAPH AND COMPOSITE PLAT BY BLUE RIDGE ENGINEERING, DECEMBER 10, 1996.
5. BOUNDARY SURVEY BY W.L. JORDEN AND COMPANY, APRIL 2, 1997. LAW CSR SOIL BORINGS AND MONITORING WELLS SURVEYED BY W.L. JORDEN IN 1997, 1998, 1999, AND 2000.
6. MARIETTA FERTILIZER WORKS STRUCTURES FROM SANBORN FIRE INSURANCE MAP 1911.
7. MACTEC/LAW CSR SOIL BORINGS AND MONITORING WELLS (2002-2007) AND SURFACE WATER LOCATIONS SURVEYED BY MACTEC ENGINEERING AND CONSULTING INC.
8. PROPERTY OWNERS SHOWN ARE BASED ON 1996 FULTON COUNTY TAX RECORDS
9. WHITAKER AND MARY L. McQUEEN PROPERTY BOUNDARIES WERE REVISED AND ARE APPROXIMATE AND ARE BASED ON FULTON COUNTY BOARD OF ASSESSORS RECORDS 2004-2005 AT www.fultonassessor.org

CADD NOTE: DRAWING XREFS ROTATED @ 0,0; 55° FROM SURVEY FILE COORDINATE POSITION.

LEGEND:

- MW-104 — LAW/MACTEC/AMEC MONITORING WELL LOCATIONS (MW-1B, MW-101, MW-104A, MW-104D, MW-105, MW-106D, MW-107D, MW-108, MW-109, AND MW-110, MW-111 THROUGH MW-117, MW-119 MW-120 AND MW-121 (FEBRUARY, JUNE, JULY, DECEMBER 1997, MAY 1998, JANUARY 2000, NOVEMBER 2002, AUGUST 2007 AND 2012).
- MW-26 — T.M. GATES MONITORING WELL LOCATIONS (MW-1 TO MW-27, DW-1A, DW-1B, DW-2A, AND DW-2B) (AUGUST 1983, JANUARY 1984, JUNE 1985)
- MW-19 — MONITORING WELLS ABANDONED (MW-1, MW-1A, MW-2, MW-3, MW-4, MW-6, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-23, MW-27, DW-1A, DW-2A, DW-2B, MW-103A, MW-103D, MW-104 AND MW-118) (JUNE 1995, JUNE 1997, AUGUST 1998, JANUARY 2000, AUGUST 2007 AND 2008)
- TW-1 — TEMPORARY WELL
- OW-1 — OBSERVATION WELL FOR PILOT INJECTION STUDY
- STREAM GAUGE
- SW-2007-1 — MACTEC SURFACE WATER SAMPLING LOCATION (SW-101 TO SW-105 (NOVEMBER 2002), (MAIN POINT AND ALLIED OUTFALL MAY 2004), (SW-2007-1 TO SW-2007-6 AUGUST 2007), AND (SW-2010-1 TO SW-2010-18, SW2014-20, SW2014-21, INFLOW-1, INFLOW-2 SEPTEMBER 2010, NOVEMBER 2012, MAY 2014)
- PROPERTY BOUNDARIES
- ABOVEGROUND POWER TRANSMISSION LINES
- BELOWGROUND FIBER OPTICS CABLE
- FENCE
- EXISTING STRUCTURE
- FORMER STRUCTURE
- TREE LINE
- STREAM
- 840 — ESTECH SITE POTENTIOMETRIC CONTOURS FOR SAPROLITE AND BEDROCK WITH GROUNDWATER ELEVATIONS ARE FROM MAY 2018. (5.0 FT CONTOURS).
- 888 — M&J SOLVENTS SITE POTENTIOMETRIC SURFACE CONTOURS FOR SAPROLITE WITH GROUNDWATER ELEVATIONS ARE FROM MARCH 2014 (1.0 FT CONTOURS).
- BDL — BELOW DETECTION LIMIT
- 744.8 — TOTAL VOLATILE ORGANIC COMPOUND (VOCS) CONCENTRATIONS FOR M&J SOLVENTS SITE ARE FROM MARCH AND APRIL 2014
- 222.6 — TOTAL VOCS CONCENTRATIONS SHOWN ON ESTECH SITE ARE FROM MAY 2018.
  VOCS = TOTAL CONCENTRATIONS OF VOLATILE ORGANIC COMPOUNDS
  TOTAL CVOCS = TOTAL CONCENTRATIONS OF CHLORINATED VOCS
  BTEX = TOTAL CONCENTRATIONS OF BENZENE, ETHLYBENZENE, TOLUENE, AND XYLENES
  TOTAL KETONES = TOTAL CONCENTRATIONS OF KETONES: ACETONE, 2-BUTANONE, 4-METHYL-2-PENTANONE
  VOC CONCENTRATIONS ARE IN UG/L
  NS = NOT SAMPLED
  NA = VOCs NOT ANALYZED
- WELLS WITH DETECTIONS OF VOCs
- • 843.77 — GROUNDWATER ELEVATIONS IN WELLS NOT USED TO CALCULATE POTENTIOMETRIC SURFACE
- • — MONITORING WELL NOT USED FOR CONTOURING

SCALE IN FEET
0 100

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED A. SHOREDITS
DRAWN T. GLADSTONE
CHECKED R. QUINN
IN CHARGE G. WRENN
DATE 8/1/2018

FORMER ESTECH GENERAL CHEMICALS SITE
ATLANTA, GEORGIA

wood.

ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.
1075 BIG SHANTY ROAD, NW, SUITE 100
KENNESAW, GEORGIA 30144 (770) 421-3400

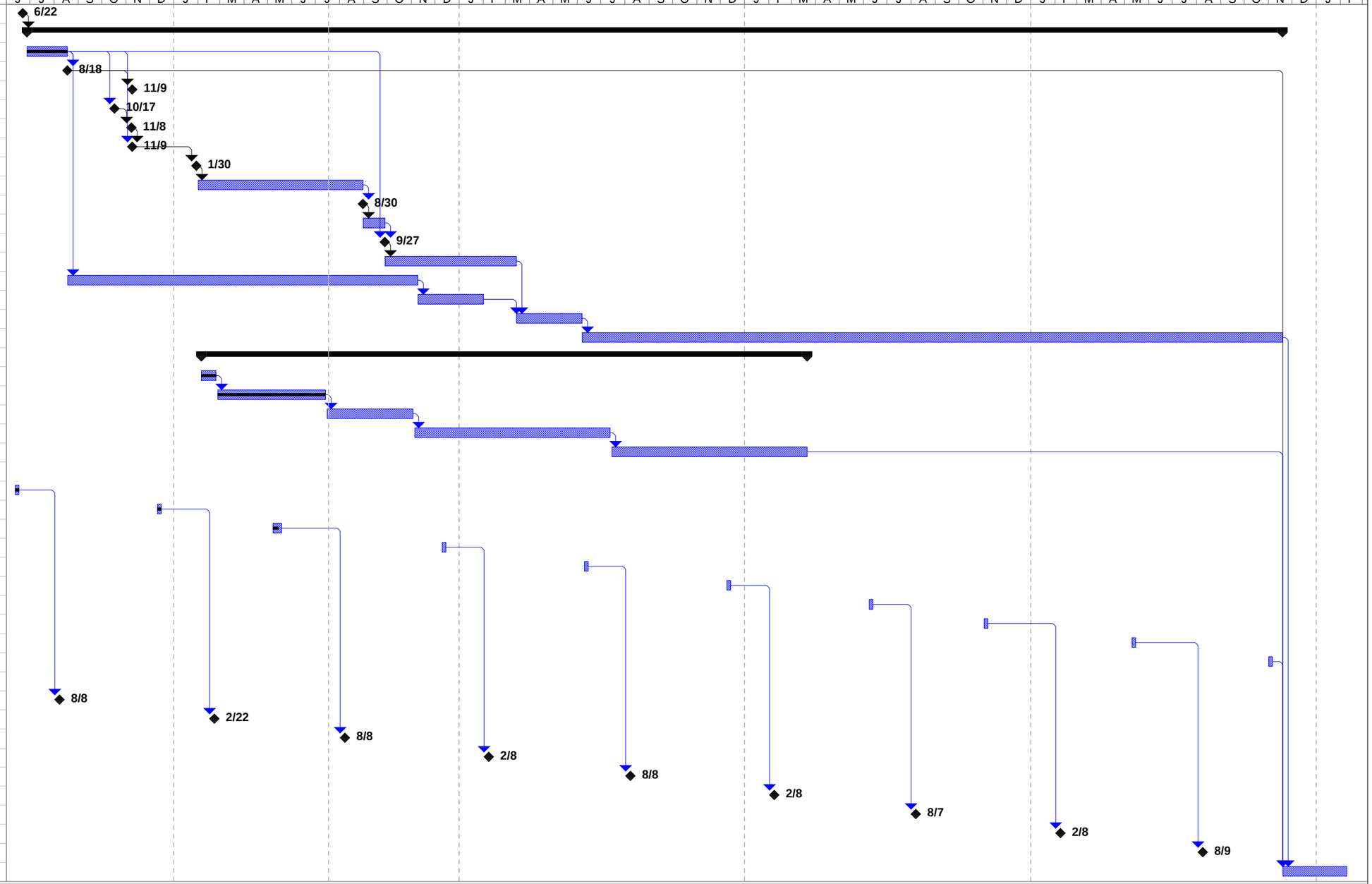
TOTAL VOLATILE ORGANIC COMPOUND (VOCs) CONCENTRATIONS IN GROUNDWATER WITH POTENTIOMETRIC SURFACE CONTOURS

SCALE: AS SHOWN
CONTRACT: 6122-08-0154
DWG. NO.: 6
REV:
PAGE NO:

L:\BFEL_ATLANTA\JUNE 2018\TOTAL VOLATILE ORGANICS.dwg — Layout1 06/02/2018 3:17pm Forrest.Gladstone

FIGURE 7 - SCHEDULE FOR CONTINUED IMPLEMENTATION OF VOLUNTARY REMEDIATON PLAN
FORMER ESTECH, ATLANTA, GA

ID	Task Name
1	EPD Meeting (6/22/17)
2	**Surficial Limestone PRB Implementation**
3	Complete Design
4	Submit PCN to USACE
5	PCN Approved by USACE
6	Submit Stream Buffer Variance to COA
7	COA Approved Buffer Variance
8	Submit Stream Buffer Variance to EPD
9	EPD Comments Received
10	Obtain CSX Signature on EPD Buffer Variance
11	Re-Submit EPD Buffer Variance
12	EPD Review Buffer Variance
13	Submit Land Dist. Permit to COA
14	COA Review
15	Obtain Access Agreement with CSX
16	Bidding/Procurement
17	Construct PRB
18	Performance Evaluation
19	**Soil Remediation**
20	Conduct Surface Soil Investigation
21	Update HH/Ecological Risk Evaluation
22	Evaluate Soil Remediation Alternatives
23	Soil Remediation Implementation
24	Implement Environmental Covenant
25	**Semi-Annual GW/SW Sampling**
26	Semi-Annual GW/SW Sampling 11
27	Semi-Annual GW/SW Sampling 12
28	Semi-Annual GW/SW Sampling 13
29	Semi-Annual GW/SW Sampling 14
30	Semi-Annual GW/SW Sampling 15
31	Semi-Annual GW/SW Sampling 16
32	Semi-Annual GW/SW Sampling 17
33	Semi-Annual GW/SW Sampling 18
34	Semi-Annual GW/SW Sampling 19
35	Semi-Annual GW/SW Sampling 20
36	**Submit Semi-Annual Status Report**
37	Submit Semi-Annual Status Report 11
38	Submit Semi-Annual Status Report 12
39	Submit Semi-Annual Status Report 13
40	Submit Semi-Annual Status Report 14
41	Submit Semi-Annual Status Report 15
42	Submit Semi-Annual Status Report 16
43	Submit Semi-Annual Status Report 17
44	Submit Semi-Annual Status Report 18
45	Submti Semi-Annual Status Report 19
46	Submit Final Compliance Status Report



Project: BFEL Atlanta VRP Schedule
Date: Wed 7/18/18

Task	Project Summary	Inactive Summary	Manual Summary	External Milestone	
Split	External Tasks	Manual Task	Start-only	Progress	
Milestone	External Milestone	Duration-only	Finish-only	Deadline	
Summary	Inactive Milestone	Manual Summary Rollup	External Tasks		

APPENDIX A

LABORATORY REPORTS AND FIELD SAMPLING FORMS FOR MAY 2018 GROUNDWATER SAMPLING EVENT AND LABORATORY REPORTS FOR FEBRUARY 2018 SURFACE SOIL INVESTIGATION

WATER LABORATORY REPORTS

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

June 26, 2018

Rhonda Quinn
Wood Environment & Infrastructure
1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805A43

Analytical Environmental Services, Inc. received 9 samples on 5/9/2018 5:55:00 PM
for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar
Project Manager

Revision 6/26/2018

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive, Atlanta GA 30340-3704

AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805A43

Date: 5/9/18 Page 1 of 1

COMPANY: Wood E&IS

ADDRESS: 1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144

PHONE: 770-421-3400

FAX:

SAMPLED BY: D Howard, E Guillen, B Rhiner

SIGNATURE: Daniel L Howard

ANALYSIS REQUESTED

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	VOC 1,5 + 8260	T&T metals 6020 *	Diss metals 6020 *	Pest + 8081A	Nitrate Sulfate 9056	No # of Containers
	PRESERVATION (See codes)						H	N	I	I	I	
1	Trip Blank-02	5/9/18	1000	X		W	2					2
2	EB-02		1100	X		W	2	1	2**	2	1	6
3	TW-12		1350	X		GW	2**	1	1	2	1	5
4	TW-1		1618	X		GW	2	1	1	2	1	7
5	MW-101		1301	X		GW	2	1	1	2	1	7
6	MW-104D		1010	X		GW	2	1	1	2	1	7
7	DUP-1		1200	X		GW	2					2
8	MW-104A		1255	X		GW	2	1	1	2	1	7
9	MW-107D		1610	X		GW	2	1	1	2	1	7
10	Temp Blank											
11												
12												
13												
14												

REMARKS

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Daniel L Howard	5/9/18/1712	1:	5/9/18 5:12
2:	5/9/18 5:55	2: Essence Moore	5/9/18 5:55p
3:		3:	

PROJECT INFORMATION

PROJECT NAME: BFEL Atlanta

PROJECT #: 61220801S4.28

SITE ADDRESS: 1525 Pine St Atlanta GA

SEND REPORT TO: Rhonda Quinn

INVOICE TO: (IF DIFFERENT FROM ABOVE)

QUOTE #: PO#:

RECEIPT

Total # of Containers

Turnaround Time Request

- (●) Standard 5 Business Days
- ( ) 2 Business Day Rush
- ( ) Next Business Day Rush
- ( ) Same Day Rush (auth req.)
- ( ) Other

STATE PROGRAM (if any):

E-mail? Y / N; Fax? Y / N

DATA PACKAGE: I (II) III IV

SPECIAL INSTRUCTIONS/COMMENTS:

Lab will Filter dissolved metals

* Metals = As, Pb, Cu, Zn

SHIPMENT METHOD

OUT / / VIA:

IN / / VIA:

CLIENT FedEx UPS MAIL (COURIER) GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES.
SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: Wood Environment & Infrastructure
Project: BFEL Atlanta
Lab ID: 1805A43

Case Narrative

Volatiles Organic Compounds Analysis by Method 8260B:

Due to sample matrix, samples 1805A43-006A, & -007A required dilution during preparation and/or analysis resulting in elevated reporting limits.

Pesticide Analysis by Method 8081B:

Due to sample matrix, sample 1805A43-004D required dilution during preparation and/or analysis resulting in elevated reporting limits.

Metals Analysis by Method 6020B:

Due to sample matrix, samples 1805A43-003A, -006B and -009B required dilution during preparation and/or analysis resulting in elevated reporting limits for Copper and Zinc.

Analytical Environmental Services, Inc

Date: 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TRIP BLANK-02
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 10:00:00 AM
Lab ID:	1805A43-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 20:01	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 20:01	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 20:01	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 20:01	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 20:01	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 20:01	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 20:01	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 20:01	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 20:01	OM
Surr: 4-Bromofluorobenzene	95.6	68-127		%REC	260639	1	05/11/2018 20:01	OM
Surr: Dibromofluoromethane	105	84.4-122		%REC	260639	1	05/11/2018 20:01	OM
Surr: Toluene-d8	98.9	80.1-116		%REC	260639	1	05/11/2018 20:01	OM

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	EB-02
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 11:00:00 AM
Lab ID:	1805A43-002	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 21:19	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 21:19	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 21:19	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 21:19	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 21:19	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 21:19	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Methylene chloride	0.0081	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 21:19	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 21:19	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 21:19	OM
Surr: 4-Bromofluorobenzene	97.1	68-127		%REC	260639	1	05/11/2018 21:19	OM
Surr: Dibromofluoromethane	109	84.4-122		%REC	260639	1	05/11/2018 21:19	OM
Surr: Toluene-d8	104	80.1-116		%REC	260639	1	05/11/2018 21:19	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	EB-02
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 11:00:00 AM
Lab ID:	1805A43-002	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:32	NG
Copper	BRL	0.00200		mg/L	260929	1	05/21/2018 20:32	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 20:32	NG
Zinc	BRL	0.0100		mg/L	260929	1	05/21/2018 20:32	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370061	1	05/10/2018 12:45	MP
Sulfate	BRL	1.0		mg/L	R370061	1	05/10/2018 12:45	MP
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 20:22	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 20:22	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 20:22	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 20:22	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 20:22	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 20:22	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 20:22	UH
Surr: Decachlorobiphenyl	80.6	15.4-120		%REC	260477	1	05/11/2018 20:22	UH
Surr: Tetrachloro-m-xylene	90.2	37-126		%REC	260477	1	05/11/2018 20:22	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TW-12
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 1:50:00 PM
Lab ID:	1805A43-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:38	NG
Copper	BRL	0.0100		mg/L	260929	5	05/23/2018 10:41	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 20:38	NG
Zinc	0.167	0.0100		mg/L	260929	1	05/21/2018 20:38	NG
ION SCAN SW9056A								
Nitrate	1.7	0.25		mg/L	R370061	1	05/10/2018 13:00	MP
Sulfate	58	1.0		mg/L	R370061	1	05/10/2018 13:00	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/15/2018 23:48	NG
Copper	BRL	0.00200		mg/L	260691	1	05/15/2018 23:48	NG
Lead	BRL	0.00100		mg/L	260691	1	05/15/2018 23:48	NG
Zinc	0.164	0.0100		mg/L	260691	1	05/15/2018 23:48	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 20:33	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 20:33	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 20:33	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 20:33	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 20:33	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 20:33	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 20:33	UH
Surr: Decachlorobiphenyl	80.8	15.4-120		%REC	260477	1	05/11/2018 20:33	UH
Surr: Tetrachloro-m-xylene	64.3	37-126		%REC	260477	1	05/11/2018 20:33	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TW-1
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 4:18:00 PM
Lab ID:	1805A43-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
1,1,1-Trichloroethane	0.0050	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 23:02	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 23:02	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 23:02	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 23:02	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 23:02	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
cis-1,2-Dichloroethene	0.82	0.10		mg/L	260639	20	05/11/2018 23:28	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 23:02	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Naphthalene	0.013	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Tetrachloroethene	0.0070	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 23:02	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Trichloroethene	0.92	0.10		mg/L	260639	20	05/11/2018 23:28	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Vinyl chloride	0.0028	0.0020		mg/L	260639	1	05/11/2018 23:02	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 23:02	OM
Surr: 4-Bromofluorobenzene	101	68-127		%REC	260639	1	05/11/2018 23:02	OM
Surr: 4-Bromofluorobenzene	97.2	68-127		%REC	260639	20	05/11/2018 23:28	OM
Surr: Dibromofluoromethane	113	84.4-122		%REC	260639	1	05/11/2018 23:02	OM
Surr: Dibromofluoromethane	105	84.4-122		%REC	260639	20	05/11/2018 23:28	OM
Surr: Toluene-d8	104	80.1-116		%REC	260639	1	05/11/2018 23:02	OM

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TW-1
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 4:18:00 PM
Lab ID:	1805A43-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
Surr: Toluene-d8	95.8	80.1-116		%REC	260639	20	05/11/2018 23:28	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:45	NG
Copper	0.00272	0.00200		mg/L	260929	1	05/22/2018 20:02	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 20:45	NG
Zinc	0.303	0.0100		mg/L	260929	1	05/21/2018 20:45	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370061	1	05/10/2018 13:15	MP
Sulfate	60	1.0		mg/L	R370061	1	05/10/2018 13:15	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/15/2018 23:54	NG
Copper	BRL	0.00200		mg/L	260691	1	05/15/2018 23:54	NG
Lead	BRL	0.00100		mg/L	260691	1	05/15/2018 23:54	NG
Zinc	0.359	0.100		mg/L	260691	10	05/16/2018 19:51	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	0.00060	0.00010		mg/L	260477	1	05/11/2018 20:44	UH
4,4´-DDE	0.00060	0.00010		mg/L	260477	1	05/11/2018 20:44	UH
4,4´-DDT	0.00038	0.00010		mg/L	260477	1	05/11/2018 20:44	UH
alpha-BHC	0.00032	0.000050		mg/L	260477	1	05/11/2018 20:44	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:44	UH
beta-BHC	0.0039	0.00020		mg/L	260477	4	05/14/2018 21:46	UH
delta-BHC	0.00027	0.000050		mg/L	260477	1	05/11/2018 20:44	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 20:44	UH
gamma-BHC	0.00024	0.000050		mg/L	260477	1	05/11/2018 20:44	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:44	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 20:44	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 20:44	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 20:44	UH
Surr: Decachlorobiphenyl	92.4	15.4-120		%REC	260477	1	05/11/2018 20:44	UH
Surr: Tetrachloro-m-xylene	83	37-126		%REC	260477	1	05/11/2018 20:44	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-101
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 1:01:00 PM
Lab ID:	1805A43-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 21:45	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 21:45	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 21:45	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 21:45	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 21:45	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 21:45	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 21:45	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 21:45	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 21:45	OM
Surr: 4-Bromofluorobenzene	97.5	68-127		%REC	260639	1	05/11/2018 21:45	OM
Surr: Dibromofluoromethane	109	84.4-122		%REC	260639	1	05/11/2018 21:45	OM
Surr: Toluene-d8	98.9	80.1-116		%REC	260639	1	05/11/2018 21:45	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-101
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 1:01:00 PM
Lab ID:	1805A43-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:51	NG
Copper	0.0357	0.0200		mg/L	260929	10	05/22/2018 20:08	NG
Lead	0.00539	0.00100		mg/L	260929	1	05/21/2018 20:51	NG
Zinc	2.35	0.100		mg/L	260929	10	05/22/2018 20:08	NG
ION SCAN SW9056A								
Nitrate	18	2.5		mg/L	R370061	10	05/10/2018 16:01	MP
Sulfate	86	1.0		mg/L	R370061	1	05/10/2018 13:30	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260691	1	05/16/2018 00:19	NG
Copper	0.0164	0.00200		mg/L	260691	1	05/16/2018 00:19	NG
Lead	0.00193	0.00100		mg/L	260691	1	05/16/2018 00:19	NG
Zinc	2.19	0.500		mg/L	260691	50	05/16/2018 19:58	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 20:55	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 20:55	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 20:55	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 20:55	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 20:55	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 20:55	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 20:55	UH
Surr: Decachlorobiphenyl	87.4	15.4-120		%REC	260477	1	05/11/2018 20:55	UH
Surr: Tetrachloro-m-xylene	47.8	37-126		%REC	260477	1	05/11/2018 20:55	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-104D
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 10:10:00 AM
Lab ID:	1805A43-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,1,2,2-Tetrachloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,1,2-Trichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,1-Dichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,1-Dichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,1-Dichloropropene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,2,4-Trichlorobenzene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,2-Dichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,2-Dichloropropane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
1,4-Dioxane	48	15		mg/L	260639	100	05/12/2018 01:12	OM
2-Butanone	260	50		mg/L	260639	1000	05/12/2018 00:20	OM
4-Methyl-2-pentanone	97	10		mg/L	260639	1000	05/12/2018 00:20	OM
Acetone	230	50		mg/L	260639	1000	05/12/2018 00:20	OM
Benzene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Carbon disulfide	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Carbon tetrachloride	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Chlorobenzene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Chloroethane	BRL	1.0		mg/L	260639	100	05/12/2018 01:12	OM
Chloroform	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Chloromethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
cis-1,2-Dichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Cyclohexane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Ethylbenzene	4.6	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Isobutyl Alcohol	BRL	20		mg/L	260639	100	05/12/2018 01:12	OM
Isopropylbenzene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Methylene chloride	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Naphthalene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Styrene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Tetrachloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Tetrahydrofuran	38	10		mg/L	260639	1000	05/12/2018 00:20	OM
Toluene	53	5.0		mg/L	260639	1000	05/12/2018 00:20	OM
trans-1,2-Dichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Trichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Trichlorofluoromethane	BRL	0.50		mg/L	260639	100	05/12/2018 01:12	OM
Vinyl chloride	BRL	0.20		mg/L	260639	100	05/12/2018 01:12	OM
Xylenes, Total	15	5.0		mg/L	260639	1000	05/12/2018 00:20	OM
Surr: 4-Bromofluorobenzene	98.8	68-127		%REC	260639	1000	05/12/2018 00:20	OM
Surr: 4-Bromofluorobenzene	100	68-127		%REC	260639	100	05/12/2018 01:12	OM
Surr: 4-Bromofluorobenzene	119	68-127		%REC	260639	100	05/12/2018 01:12	OM
Surr: Dibromofluoromethane	118	84.4-122		%REC	260639	100	05/12/2018 01:12	OM
Surr: Dibromofluoromethane	101	84.4-122		%REC	260639	100	05/12/2018 01:12	OM

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-104D
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 10:10:00 AM
Lab ID:	1805A43-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
Surr: Dibromofluoromethane	105	84.4-122		%REC	260639	1000	05/12/2018 00:20	OM
Surr: Toluene-d8	105	80.1-116		%REC	260639	100	05/12/2018 01:12	OM
Surr: Toluene-d8	112	80.1-116		%REC	260639	100	05/12/2018 01:12	OM
Surr: Toluene-d8	105	80.1-116		%REC	260639	1000	05/12/2018 00:20	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:57	NG
Copper	BRL	0.0100		mg/L	260929	5	05/22/2018 20:14	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 20:57	NG
Zinc	BRL	0.0500		mg/L	260929	5	05/22/2018 20:14	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370061	1	05/10/2018 13:45	MP
Sulfate	BRL	1.0		mg/L	R370061	1	05/10/2018 13:45	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/16/2018 00:26	NG
Copper	BRL	0.00200		mg/L	260691	1	05/16/2018 00:26	NG
Lead	BRL	0.00100		mg/L	260691	1	05/16/2018 00:26	NG
Zinc	BRL	0.0100		mg/L	260691	1	05/16/2018 00:26	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 21:06	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 21:06	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 21:06	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 21:06	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 21:06	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 21:06	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 21:06	UH
Surr: Decachlorobiphenyl	80.1	15.4-120		%REC	260477	1	05/11/2018 21:06	UH
Surr: Tetrachloro-m-xylene	82.5	37-126		%REC	260477	1	05/11/2018 21:06	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	DUP-1
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 12:00:00 PM
Lab ID:	1805A43-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
1,1,1-Trichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,1,2,2-Tetrachloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,1,2-Trichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,1-Dichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,1-Dichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,1-Dichloropropene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,2,4-Trichlorobenzene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,2-Dichloroethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,2-Dichloropropane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
1,4-Dioxane	46	15		mg/L	260639	100	05/12/2018 00:46	OM
2-Butanone	260	50		mg/L	260639	1000	05/11/2018 23:54	OM
4-Methyl-2-pentanone	100	10		mg/L	260639	1000	05/11/2018 23:54	OM
Acetone	250	50		mg/L	260639	1000	05/11/2018 23:54	OM
Benzene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Carbon disulfide	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Carbon tetrachloride	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Chlorobenzene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Chloroethane	BRL	1.0		mg/L	260639	100	05/12/2018 00:46	OM
Chloroform	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Chloromethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
cis-1,2-Dichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Cyclohexane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Ethylbenzene	4.5	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Isobutyl Alcohol	BRL	20		mg/L	260639	100	05/12/2018 00:46	OM
Isopropylbenzene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Methylene chloride	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Naphthalene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Styrene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Tetrachloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Tetrahydrofuran	41	10		mg/L	260639	1000	05/11/2018 23:54	OM
Toluene	57	5.0		mg/L	260639	1000	05/11/2018 23:54	OM
trans-1,2-Dichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Trichloroethene	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Trichlorofluoromethane	BRL	0.50		mg/L	260639	100	05/12/2018 00:46	OM
Vinyl chloride	BRL	0.20		mg/L	260639	100	05/12/2018 00:46	OM
Xylenes, Total	16	5.0		mg/L	260639	1000	05/11/2018 23:54	OM
Surr: 4-Bromofluorobenzene	119	68-127		%REC	260639	100	05/12/2018 00:46	OM
Surr: 4-Bromofluorobenzene	100	68-127		%REC	260639	100	05/12/2018 00:46	OM
Surr: 4-Bromofluorobenzene	96.9	68-127		%REC	260639	1000	05/11/2018 23:54	OM
Surr: Dibromofluoromethane	100	84.4-122		%REC	260639	100	05/12/2018 00:46	OM
Surr: Dibromofluoromethane	116	84.4-122		%REC	260639	100	05/12/2018 00:46	OM

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	DUP-1
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 12:00:00 PM
Lab ID:	1805A43-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
Surr: Dibromofluoromethane	108	84.4-122		%REC	260639	1000	05/11/2018 23:54	OM
Surr: Toluene-d8	104	80.1-116		%REC	260639	100	05/12/2018 00:46	OM
Surr: Toluene-d8	111	80.1-116		%REC	260639	100	05/12/2018 00:46	OM
Surr: Toluene-d8	109	80.1-116		%REC	260639	1000	05/11/2018 23:54	OM

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-104A
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 12:55:00 PM
Lab ID:	1805A43-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 22:11	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 22:11	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 22:11	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 22:11	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 22:11	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 22:11	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 22:11	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 22:11	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 22:11	OM
Surr: 4-Bromofluorobenzene	95.2	68-127		%REC	260639	1	05/11/2018 22:11	OM
Surr: Dibromofluoromethane	110	84.4-122		%REC	260639	1	05/11/2018 22:11	OM
Surr: Toluene-d8	101	80.1-116		%REC	260639	1	05/11/2018 22:11	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-104A
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 12:55:00 PM
Lab ID:	1805A43-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 21:03	NG
Copper	BRL	0.00200		mg/L	260929	1	05/21/2018 21:03	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 21:03	NG
Zinc	BRL	0.0100		mg/L	260929	1	05/21/2018 21:03	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370061	1	05/10/2018 14:01	MP
Sulfate	86	1.0		mg/L	R370061	1	05/10/2018 14:01	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260691	1	05/16/2018 00:32	NG
Copper	BRL	0.00200		mg/L	260691	1	05/16/2018 00:32	NG
Lead	BRL	0.00100		mg/L	260691	1	05/16/2018 00:32	NG
Zinc	BRL	0.0100		mg/L	260691	1	05/16/2018 00:32	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 21:17	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 21:17	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 21:17	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 21:17	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 21:17	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 21:17	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 21:17	UH
Surr: Decachlorobiphenyl	80.6	15.4-120		%REC	260477	1	05/11/2018 21:17	UH
Surr: Tetrachloro-m-xylene	84.7	37-126		%REC	260477	1	05/11/2018 21:17	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-107D
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 4:10:00 PM
Lab ID:	1805A43-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 22:37	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 22:37	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 22:37	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 22:37	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 22:37	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 22:37	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 22:37	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 22:37	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 22:37	OM
Surr: 4-Bromofluorobenzene	94.8	68-127		%REC	260639	1	05/11/2018 22:37	OM
Surr: Dibromofluoromethane	108	84.4-122		%REC	260639	1	05/11/2018 22:37	OM
Surr: Toluene-d8	101	80.1-116		%REC	260639	1	05/11/2018 22:37	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-107D
Project Name:	BFEL Atlanta	**Collection Date:**	5/9/2018 4:10:00 PM
Lab ID:	1805A43-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 21:10	NG
Copper	BRL	0.0100		mg/L	260929	5	05/22/2018 20:21	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 21:10	NG
Zinc	BRL	0.0500		mg/L	260929	5	05/22/2018 20:21	NG
ION SCAN SW9056A								
Nitrate	2.4	0.25		mg/L	R370061	1	05/10/2018 15:16	MP
Sulfate	91	1.0		mg/L	R370061	1	05/10/2018 15:16	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/16/2018 00:38	NG
Copper	BRL	0.00200		mg/L	260691	1	05/16/2018 00:38	NG
Lead	BRL	0.00100		mg/L	260691	1	05/16/2018 00:38	NG
Zinc	BRL	0.0100		mg/L	260691	1	05/16/2018 00:38	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 21:29	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 21:29	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 21:29	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 21:29	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 21:29	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 21:29	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 21:29	UH
Surr: Decachlorobiphenyl	88	15.4-120		%REC	260477	1	05/11/2018 21:29	UH
Surr: Tetrachloro-m-xylene	87.8	37-126		%REC	260477	1	05/11/2018 21:29	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: EB-02				**Lab ID:** 1805A43-002			
Collection Date: 5/9/2018 11:00:00 AM				**Matrix:** Aqueous			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Methylene chloride	0.0081		0.0012	0.0050	mg/L	260639	1
Client Sample ID: TW-12				**Lab ID:** 1805A43-003			
Collection Date: 5/9/2018 1:50:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.167		0.00168	0.0100	mg/L	260929	1
ION SCAN SW9056A							
Nitrate	1.7		0.055	0.25	mg/L	R370061	1
Sulfate	58		0.12	1.0	mg/L	R370061	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.164		0.00168	0.0100	mg/L	260691	1
Client Sample ID: TW-1				**Lab ID:** 1805A43-004			
Collection Date: 5/9/2018 4:18:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
1,1,1-Trichloroethane	0.0050		0.00030	0.0050	mg/L	260639	1
cis-1,2-Dichloroethene	0.82		0.0056	0.10	mg/L	260639	20
Naphthalene	0.013		0.00093	0.0050	mg/L	260639	1
Tetrachloroethene	0.0070		0.00046	0.0050	mg/L	260639	1
Trichloroethene	0.92		0.0061	0.10	mg/L	260639	20
Vinyl chloride	0.0028		0.00030	0.0020	mg/L	260639	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00272		0.00186	0.00200	mg/L	260929	1
Zinc	0.303		0.00168	0.0100	mg/L	260929	1
ION SCAN SW9056A							
Sulfate	60		0.12	1.0	mg/L	R370061	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.359		0.0168	0.100	mg/L	260691	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
4,4´-DDD	0.00060		0.000014	0.00010	mg/L	260477	1
4,4´-DDE	0.00060		0.000010	0.00010	mg/L	260477	1
4,4´-DDT	0.00038		0.000007	0.00010	mg/L	260477	1
alpha-BHC	0.00032		0.000010	0.000050	mg/L	260477	1
beta-BHC	0.0039		0.000015	0.00020	mg/L	260477	4
delta-BHC	0.00027		0.000009	0.000050	mg/L	260477	1
gamma-BHC	0.00024		0.000005	0.000050	mg/L	260477	1
Client Sample ID: MW-101				**Lab ID:** 1805A43-005			
Collection Date: 5/9/2018 1:01:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0357		0.0186	0.0200	mg/L	260929	10
Lead	0.00539		0.000621	0.00100	mg/L	260929	1
Zinc	2.35		0.0168	0.100	mg/L	260929	10
ION SCAN SW9056A							
Nitrate	18		0.55	2.5	mg/L	R370061	10
Sulfate	86		0.12	1.0	mg/L	R370061	1

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-101				**Lab ID:** 1805A43-005			
Collection Date: 5/9/2018 1:01:00 PM				**Matrix:** Groundwater			
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0164		0.00186	0.00200	mg/L	260691	1
Lead	0.00193		0.000621	0.00100	mg/L	260691	1
Zinc	2.19		0.0840	0.500	mg/L	260691	50
Client Sample ID: MW-104D				**Lab ID:** 1805A43-006			
Collection Date: 5/9/2018 10:10:00 AM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
1,4-Dioxane	48		6.3	15	mg/L	260639	100
2-Butanone	260		2.5	50	mg/L	260639	1000
4-Methyl-2-pentanone	97		0.44	10	mg/L	260639	1000
Acetone	230		3.6	50	mg/L	260639	1000
Ethylbenzene	4.6		0.026	0.50	mg/L	260639	100
Tetrahydrofuran	38		1.3	10	mg/L	260639	1000
Toluene	53		0.39	5.0	mg/L	260639	1000
Xylenes, Total	15		0.77	5.0	mg/L	260639	1000
Client Sample ID: DUP-1				**Lab ID:** 1805A43-007			
Collection Date: 5/9/2018 12:00:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
1,4-Dioxane	46		6.3	15	mg/L	260639	100
2-Butanone	260		2.5	50	mg/L	260639	1000
4-Methyl-2-pentanone	100		0.44	10	mg/L	260639	1000
Acetone	250		3.6	50	mg/L	260639	1000
Ethylbenzene	4.5		0.026	0.50	mg/L	260639	100
Tetrahydrofuran	41		1.3	10	mg/L	260639	1000
Toluene	57		0.39	5.0	mg/L	260639	1000
Xylenes, Total	16		0.77	5.0	mg/L	260639	1000
Client Sample ID: MW-104A				**Lab ID:** 1805A43-008			
Collection Date: 5/9/2018 12:55:00 PM				**Matrix:** Groundwater			
ION SCAN SW9056A							
Sulfate	86		0.12	1.0	mg/L	R370061	1
Client Sample ID: MW-107D				**Lab ID:** 1805A43-009			
Collection Date: 5/9/2018 4:10:00 PM				**Matrix:** Groundwater			
ION SCAN SW9056A							
Nitrate	2.4		0.055	0.25	mg/L	R370061	1
Sulfate	91		0.12	1.0	mg/L	R370061	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear | Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Locked

Analytical Environmental Services, Inc

Date: 26-Jun-18

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Lab Order: 1805A43

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805A43-001A	TRIP BLANK-02	5/9/2018 10:00:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-002A	EB-02	5/9/2018 11:00:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-002B	EB-02	5/9/2018 11:00:00AM	Aqueous	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-002C	EB-02	5/9/2018 11:00:00AM	Aqueous	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805A43-002D	EB-02	5/9/2018 11:00:00AM	Aqueous	ION SCAN			05/10/2018
1805A43-003A	TW-12	5/9/2018 1:50:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-003A	TW-12	5/9/2018 1:50:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/23/2018
1805A43-003B	TW-12	5/9/2018 1:50:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/15/2018
1805A43-003C	TW-12	5/9/2018 1:50:00PM	Groundwater	ION SCAN			05/10/2018
1805A43-003D	TW-12	5/9/2018 1:50:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805A43-004A	TW-1	5/9/2018 4:18:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-004B	TW-1	5/9/2018 4:18:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-004B	TW-1	5/9/2018 4:18:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805A43-004C	TW-1	5/9/2018 4:18:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/15/2018
1805A43-004C	TW-1	5/9/2018 4:18:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/16/2018
1805A43-004D	TW-1	5/9/2018 4:18:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805A43-004D	TW-1	5/9/2018 4:18:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/14/2018
1805A43-004E	TW-1	5/9/2018 4:18:00PM	Groundwater	ION SCAN			05/10/2018
1805A43-005A	MW-101	5/9/2018 1:01:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-005B	MW-101	5/9/2018 1:01:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-005B	MW-101	5/9/2018 1:01:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805A43-005C	MW-101	5/9/2018 1:01:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/16/2018
1805A43-005D	MW-101	5/9/2018 1:01:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805A43-005E	MW-101	5/9/2018 1:01:00PM	Groundwater	ION SCAN			05/10/2018
1805A43-006A	MW-104D	5/9/2018 10:10:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/12/2018
1805A43-006B	MW-104D	5/9/2018 10:10:00AM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-006B	MW-104D	5/9/2018 10:10:00AM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805A43-006C	MW-104D	5/9/2018 10:10:00AM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/16/2018
1805A43-006D	MW-104D	5/9/2018 10:10:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Lab Order: 1805A43

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805A43-006E	MW-104D	5/9/2018 10:10:00AM	Groundwater	ION SCAN			05/10/2018
1805A43-007A	DUP-1	5/9/2018 12:00:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-007A	DUP-1	5/9/2018 12:00:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/12/2018
1805A43-008A	MW-104A	5/9/2018 12:55:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-008B	MW-104A	5/9/2018 12:55:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-008C	MW-104A	5/9/2018 12:55:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/16/2018
1805A43-008D	MW-104A	5/9/2018 12:55:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805A43-008E	MW-104A	5/9/2018 12:55:00PM	Groundwater	ION SCAN			05/10/2018
1805A43-009A	MW-107D	5/9/2018 4:10:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805A43-009B	MW-107D	5/9/2018 4:10:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805A43-009B	MW-107D	5/9/2018 4:10:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805A43-009C	MW-107D	5/9/2018 4:10:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/16/2018
1805A43-009D	MW-107D	5/9/2018 4:10:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805A43-009E	MW-107D	5/9/2018 4:10:00PM	Groundwater	ION SCAN			05/10/2018

AES, Inc.
3080 Presidential Drive
Atlanta GA 30340

pH Adjustment Sheet

AES Sample ID number	Test Requested	pH as Received	Required pH	Preservative Required	Lot # of Preservative	Amount Added mL or Pellets*	Final pH	Tech's Initials	Date	Time
1805A43-006B	6020_W	6	<2	HNO_3	MET-781-42	0.5 mL Pellets	1	EMS	5/9/18	8:00pm
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
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						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				
						mL Pellets				

* Number of Pellets when adding NAOH

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260477

Sample ID: **MB-260477** Client ID: Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204247**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000398	0	0.0005		79.6	15.4	120				
Surr: Tetrachloro-m-xylene	0.000473	0	0.0005		94.6	37	126				

Sample ID: **LCS-260477** Client ID: Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204248**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000970	0.00010	0.0010		97.0	61.9	135				
Dieldrin	0.001066	0.00010	0.0010		107	70.3	126				
gamma-BHC	0.001121	0.000050	0.0010		112	70.9	129				
Heptachlor	0.000989	0.000050	0.0010		98.9	63.5	128				
Surr: Decachlorobiphenyl	0.000459	0	0.0005		91.8	15.4	120				
Surr: Tetrachloro-m-xylene	0.000515	0	0.0005		103	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260477

Sample ID: **1805882-002CMS** Client ID: Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **MS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204250**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000836	0.00010	0.0010		83.6	43.2	136				
Dieldrin	0.000918	0.00010	0.0010		91.8	44	139				
gamma-BHC	0.000859	0.000050	0.0010		85.9	53.8	141				
Heptachlor	0.000779	0.000050	0.0010		77.9	34.3	144				
Surr: Decachlorobiphenyl	0.000419	0	0.0005		83.7	15.4	120				
Surr: Tetrachloro-m-xylene	0.000401	0	0.0005		80.2	37	126				

Sample ID: **1805882-002CMSD** Client ID: Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **MSD** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204251**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000964	0.00010	0.0010		96.3	43.2	136	0.0008362	14.1	21.1	
Dieldrin	0.001045	0.00010	0.0010		104	44	139	0.0009178	12.9	20	
gamma-BHC	0.000990	0.000050	0.0010		99.0	53.8	141	0.0008592	14.1	20	
Heptachlor	0.000891	0.000050	0.0010		89.1	34.3	144	0.0007790	13.4	24.4	
Surr: Decachlorobiphenyl	0.000455	0	0.0005		91.0	15.4	120	0.0004186	0	0	
Surr: Tetrachloro-m-xylene	0.000438	0	0.0005		87.7	37	126	0.0004008	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260639

Sample ID: **MB-260639** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/11/2018** Seq No: **8206112**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isobutyl Alcohol	BRL	0.20									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260639

Sample ID: **MB-260639** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/11/2018** Seq No: **8206112**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Styrene	BRL	0.0050									
Tetrachloroethene	BRL	0.0050									
Tetrahydrofuran	BRL	0.010									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04691	0	0.0500		93.8	68	127				
Surr: Dibromofluoromethane	0.05347	0	0.0500		107	84.4	122				
Surr: Toluene-d8	0.05011	0	0.0500		100	80.1	116				

Sample ID: **LCS-260639** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/11/2018** Seq No: **8206111**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.06076	0.0050	0.0500		122	69	136				
Benzene	0.04856	0.0050	0.0500		97.1	73.7	126				
Chlorobenzene	0.04788	0.0050	0.0500		95.8	73.5	124				
Toluene	0.05063	0.0050	0.0500		101	76.8	125				
Trichloroethene	0.04947	0.0050	0.0500		98.9	70.9	124				
Surr: 4-Bromofluorobenzene	0.04881	0	0.0500		97.6	68	127				
Surr: Dibromofluoromethane	0.05039	0	0.0500		101	84.4	122				
Surr: Toluene-d8	0.04941	0	0.0500		98.8	80.1	116				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260639

Sample ID: **1805A43-007AMS** Client ID: **DUP-1** Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/12/2018** Seq No: **8206142**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	59.73	5.0	50.00		119	65.7	143				
Benzene	52.83	5.0	50.00		106	66.1	137				
Chlorobenzene	50.73	5.0	50.00		101	70.9	132				
Toluene	118.0	5.0	50.00	57.17	122	63.8	141				
Trichloroethene	53.30	5.0	50.00		107	70.6	128				
Surr: 4-Bromofluorobenzene	48.93	0	50.00		97.9	68	127				
Surr: Dibromofluoromethane	50.73	0	50.00		101	84.4	122				
Surr: Toluene-d8	50.71	0	50.00		101	80.1	116				

Sample ID: **1805A43-007AMSD** Client ID: **DUP-1** Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/12/2018** Seq No: **8206150**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	54.66	5.0	50.00		109	65.7	143	59.73	8.86	17.7	
Benzene	51.55	5.0	50.00		103	66.1	137	52.83	2.45	20	
Chlorobenzene	49.78	5.0	50.00		99.6	70.9	132	50.73	1.89	20	
Toluene	110.9	5.0	50.00	57.17	107	63.8	141	118.0	6.16	20	
Trichloroethene	52.01	5.0	50.00		104	70.6	128	53.30	2.45	20	
Surr: 4-Bromofluorobenzene	49.14	0	50.00		98.3	68	127	48.93	0	0	
Surr: Dibromofluoromethane	49.66	0	50.00		99.3	84.4	122	50.73	0	0	
Surr: Toluene-d8	50.93	0	50.00		102	80.1	116	50.71	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **MB-260691**	Client ID:				Units: **mg/L**		Prep Date: **05/15/2018**		Run No: **370434**
SampleType: **MBLK**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260691**		Analysis Date: **05/15/2018**		Seq No: **8212028**
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260691**	Client ID:				Units: **mg/L**		Prep Date: **05/15/2018**		Run No: **370434**
SampleType: **LCS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260691**		Analysis Date: **05/15/2018**		Seq No: **8212029**
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1040	0.00500	0.1000		104	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09671	0.00100	0.1000		96.7	80	120				
Zinc	0.1101	0.0100	0.1000	0.008288	102	80	120				

Sample ID: **1805882-003CMS**	Client ID:				Units: **mg/L**		Prep Date: **05/15/2018**		Run No: **370434**
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260691**		Analysis Date: **05/15/2018**		Seq No: **8212031**
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1012	0.00500	0.1000		101	75	125				
Copper	0.1031	0.00200	0.1000	0.006266	96.9	75	125				
Lead	0.09112	0.00100	0.1000	0.0006851	90.4	75	125				
Zinc	0.2435	0.0100	0.1000	0.1583	85.2	75	125				

Sample ID: **1805882-003CMSD**	Client ID:				Units: **mg/L**		Prep Date: **05/15/2018**		Run No: **370434**
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260691**		Analysis Date: **05/15/2018**		Seq No: **8212032**
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1042	0.00500	0.1000		104	75	125	0.1012	2.92	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **1805882-003CMSD** Client ID:
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1104	0.00200	0.1000	0.006266	104	75	125	0.1031	6.80	20	
Lead	0.09607	0.00100	0.1000	0.0006851	95.4	75	125	0.09112	5.29	20	
Zinc	0.2561	0.0100	0.1000	0.1583	97.9	75	125	0.2435	5.05	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260929

Sample ID: **MB-260929** Client ID: Units: **mg/L** Prep Date: **05/18/2018** Run No: **370896**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260929** Analysis Date: **05/21/2018** Seq No: **8224679**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260929** Client ID: Units: **mg/L** Prep Date: **05/18/2018** Run No: **370896**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260929** Analysis Date: **05/21/2018** Seq No: **8224680**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1060	0.00500	0.1000		106	80	120				
Copper	0.1041	0.00200	0.1000		104	80	120				
Lead	0.1067	0.00100	0.1000		107	80	120				
Zinc	0.09607	0.0100	0.1000		96.1	80	120				

Sample ID: **1805882-002BMS** Client ID: Units: **mg/L** Prep Date: **05/18/2018** Run No: **370896**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260929** Analysis Date: **05/21/2018** Seq No: **8224682**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1026	0.00500	0.1000		103	75	125				
Copper	0.1144	0.00200	0.1000	0.004388	110	75	125				
Lead	0.1067	0.00100	0.1000		107	75	125				
Zinc	0.1168	0.0100	0.1000	0.02348	93.3	75	125				

Sample ID: **1805882-002BMSD** Client ID: Units: **mg/L** Prep Date: **05/18/2018** Run No: **370896**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260929** Analysis Date: **05/21/2018** Seq No: **8224683**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1057	0.00500	0.1000		106	75	125	0.1026	2.97	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: 260929

Sample ID: **1805882-002BMSD** Client ID:
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/18/2018** Run No: **370896**
BatchID: **260929** Analysis Date: **05/21/2018** Seq No: **8224683**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1121	0.00200	0.1000	0.004388	108	75	125	0.1144	2.01	20	
Lead	0.1112	0.00100	0.1000		111	75	125	0.1067	4.19	20	
Zinc	0.1151	0.0100	0.1000	0.02348	91.6	75	125	0.1168	1.48	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: R370061

Sample ID: **MB-R370061** Client ID: Units: **mg/L** Prep Date: Run No: **370061**
SampleType: **MBLK** TestCode: **ION SCAN SW9056A** BatchID: **R370061** Analysis Date: **05/10/2018** Seq No: **8201527**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370061** Client ID: Units: **mg/L** Prep Date: Run No: **370061**
SampleType: **LCS** TestCode: **ION SCAN SW9056A** BatchID: **R370061** Analysis Date: **05/10/2018** Seq No: **8201526**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.044	0.25	5.000		101	90	110				
Sulfate	24.68	1.0	25.00		98.7	90	110				

Sample ID: **1805958-021BMS** Client ID: Units: **mg/L** Prep Date: Run No: **370061**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R370061** Analysis Date: **05/10/2018** Seq No: **8201545**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.007	0.25	5.000	0.5075	110	90	110				
Sulfate	24.90	1.0	25.00	0.1378	99.0	90	110				

Sample ID: **1805958-024BMS** Client ID: Units: **mg/L** Prep Date: Run No: **370061**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R370061** Analysis Date: **05/10/2018** Seq No: **8201547**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.640	0.25	5.000	0.2137	109	90	110				
Sulfate	25.56	1.0	25.00	0.7385	99.3	90	110				

Sample ID: **1805958-021BMSD** Client ID: Units: **mg/L** Prep Date: Run No: **370061**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370061** Analysis Date: **05/10/2018** Seq No: **8201546**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.004	0.25	5.000	0.5075	110	90	110	6.007	0.036	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805A43

ANALYTICAL QC SUMMARY REPORT

BatchID: R370061

Sample ID: **1805958-021BMSD** Client ID: Units: **mg/L** Prep Date: Run No: **370061**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370061** Analysis Date: **05/10/2018** Seq No: **8201546**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	24.77	1.0	25.00	0.1378	98.5	90	110	24.90	0.514	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

May 23, 2018

Rhonda Quinn
AMEC Foster Wheeler

1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805C21

Analytical Environmental Services, Inc. received 8 samples on 5/10/2018 5:40:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar

Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805C21

Date: 5/10/18 Page 1 of 1

COMPANY:	ADDRESS:
Wood E&IS	1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144
PHONE: 770-421-3400	EMAIL:
SAMPLED BY: D Howard, E Guillen, B Rhiner	SIGNATURE: Daniel Howard

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	ANALYSIS REQUESTED: VOC 1,5,8260	Tot metals 6020 *	Diss metals 6020 *	Pest 8081A	Nitrate Sulfate 9056	PRESERVATION (see codes): H+I	N	I	I	I	REMARKS	Number of Containers
1	Trip Blank-03	5/10/18	0930	X		W	2											2
2	TW-11		1334	X		GW		1	1	2	1							5
3	MW-26		1620	X		GW	2	1	1	2	1							7
4	MW-108		1151	X		GW	2	1	1	2	1							7
5	MW-112		1531	X		GW	2	1	1	2	1							7
6	MW-105		1150	X		GW		1	1	2	1							5
7	MW-115		1435	X		GW	2	1	1	2	1							7
8	MW-117		1630	X		GW	2	1	1	2	1							7
9	Temp Blank																	
10																		
11																		
12																		
13																		
14																		

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
Daniel Howard	5/10/18/1705	1.	5/10/18 5:05
2.	5/10/18 5:40	2. Temperature Blank 7.0/8.0 °C	
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:
Lab will Filter dissolved metals
* Metals: As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail (courier) Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: BFEL Atlanta
PROJECT #: 6122080154.28
SITE ADDRESS: 1525 Pine St Atlanta, GA
SEND REPORT TO: Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ● III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: AMEC Foster Wheeler
Project: BFEL Atlanta
Lab ID: 1805C21

Case Narrative

Pesticide Analysis by Method 8081B:

Due to sample matrix, sample 1805C21-005D required dilution during analysis resulting in elevated reporting limits.

Dissolved Metals Analysis by Method 6020B:

Due to sample matrix, samples 1805C21-003C and -006B required dilution during preparation and/or analysis resulting in elevated reporting limits.

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TRIP BLANK-03
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018
Lab ID:	1805C21-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 16:30	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 16:30	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 16:30	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 16:30	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 16:30	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 16:30	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 16:30	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 16:30	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 16:30	NH
Surr: 4-Bromofluorobenzene	95.6	68-127		%REC	260937	1	05/17/2018 16:30	NH
Surr: Dibromofluoromethane	93.6	84.4-122		%REC	260937	1	05/17/2018 16:30	NH
Surr: Toluene-d8	103	80.1-116		%REC	260937	1	05/17/2018 16:30	NH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-11
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 1:34:00 PM
Lab ID:	1805C21-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260637	1	05/16/2018 03:24	NG
Copper	0.152	0.00200		mg/L	260637	1	05/16/2018 03:24	NG
Lead	BRL	0.00100		mg/L	260637	1	05/16/2018 03:24	NG
Zinc	0.594	0.0500		mg/L	260637	5	05/17/2018 15:11	NG
ION SCAN SW9056A								
Nitrate	5.5	0.25		mg/L	R370118	1	05/11/2018 12:20	MP
Sulfate	190	10		mg/L	R370118	10	05/11/2018 14:06	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 21:00	NG
Copper	0.148	0.0200		mg/L	260691	10	05/20/2018 21:04	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 21:00	NG
Zinc	0.571	0.100		mg/L	260691	10	05/20/2018 21:04	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 19:36	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 19:36	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 19:36	SH
alpha-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
beta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 19:36	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 19:36	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 19:36	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 19:36	SH
Surr: Decachlorobiphenyl	59	15.4-120		%REC	260636	1	05/15/2018 19:36	SH
Surr: Tetrachloro-m-xylene	75.9	37-126		%REC	260636	1	05/15/2018 19:36	SH

Qualifiers:

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- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-26
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 4:20:00 PM
Lab ID:	1805C21-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 20:24	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 20:24	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 20:24	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 20:24	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 20:24	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 20:24	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 20:24	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 20:24	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 20:24	NH
Surr: 4-Bromofluorobenzene	73.8	68-127		%REC	260937	1	05/17/2018 20:24	NH
Surr: Dibromofluoromethane	94.5	84.4-122		%REC	260937	1	05/17/2018 20:24	NH
Surr: Toluene-d8	109	80.1-116		%REC	260937	1	05/17/2018 20:24	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-26
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 4:20:00 PM
Lab ID:	1805C21-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260637	1	05/16/2018 03:49	NG
Copper	0.00840	0.00200		mg/L	260637	1	05/16/2018 03:49	NG
Lead	BRL	0.00100		mg/L	260637	1	05/16/2018 03:49	NG
Zinc	0.156	0.0100		mg/L	260637	1	05/16/2018 03:49	NG
ION SCAN SW9056A								
Nitrate	3.6	0.25		mg/L	R370118	1	05/11/2018 12:35	MP
Sulfate	190	10		mg/L	R370118	10	05/11/2018 14:21	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 21:06	NG
Copper	BRL	0.00500		mg/L	260691	10	05/20/2018 21:10	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 21:06	NG
Zinc	0.142	0.100		mg/L	260691	10	05/20/2018 21:10	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 19:47	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 19:47	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 19:47	SH
alpha-BHC	0.000052	0.000050		mg/L	260636	1	05/15/2018 19:47	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 19:47	SH
beta-BHC	0.00058	0.000050		mg/L	260636	1	05/15/2018 19:47	SH
delta-BHC	0.000058	0.000050		mg/L	260636	1	05/16/2018 19:24	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 19:47	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 19:47	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 19:47	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 19:47	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 19:47	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 19:47	SH
Surr: Decachlorobiphenyl	89.8	15.4-120		%REC	260636	1	05/15/2018 19:47	SH
Surr: Tetrachloro-m-xylene	90	37-126		%REC	260636	1	05/15/2018 19:47	SH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-108
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 11:51:00 AM
Lab ID:	1805C21-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 20:49	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 20:49	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 20:49	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 20:49	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 20:49	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 20:49	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 20:49	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 20:49	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 20:49	NH
Surr: 4-Bromofluorobenzene	112	68-127		%REC	260937	1	05/17/2018 20:49	NH
Surr: Dibromofluoromethane	100	84.4-122		%REC	260937	1	05/17/2018 20:49	NH
Surr: Toluene-d8	96.3	80.1-116		%REC	260937	1	05/17/2018 20:49	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-108
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 11:51:00 AM
Lab ID:	1805C21-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260637	1	05/16/2018 03:56	NG
Copper	0.179	0.00200		mg/L	260637	1	05/16/2018 03:56	NG
Lead	BRL	0.00100		mg/L	260637	1	05/16/2018 03:56	NG
Zinc	2.37	0.200		mg/L	260637	20	05/17/2018 15:17	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370118	1	05/11/2018 12:50	MP
Sulfate	260	10		mg/L	R370118	10	05/11/2018 14:36	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 21:12	NG
Copper	0.198	0.0200		mg/L	260691	10	05/20/2018 21:16	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 21:12	NG
Zinc	2.40	0.100		mg/L	260691	10	05/20/2018 21:16	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	0.00014	0.00010		mg/L	260636	1	05/15/2018 19:58	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 19:58	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 19:58	SH
alpha-BHC	0.00067	0.000050		mg/L	260636	1	05/16/2018 20:09	UH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 19:58	SH
beta-BHC	0.0015	0.000050		mg/L	260636	1	05/15/2018 19:58	SH
delta-BHC	0.00010	0.000050		mg/L	260636	1	05/16/2018 20:09	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 19:58	SH
gamma-BHC	0.00029	0.000050		mg/L	260636	1	05/15/2018 19:58	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 19:58	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 19:58	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 19:58	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 19:58	SH
Surr: Decachlorobiphenyl	75	15.4-120		%REC	260636	1	05/15/2018 19:58	SH
Surr: Tetrachloro-m-xylene	92.3	37-126		%REC	260636	1	05/15/2018 19:58	SH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-112
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 3:31:00 PM
Lab ID:	1805C21-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/18/2018 14:47	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/18/2018 14:47	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/18/2018 14:47	NH
Acetone	BRL	0.050		mg/L	260937	1	05/18/2018 14:47	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/18/2018 14:47	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/18/2018 14:47	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/18/2018 14:47	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/18/2018 14:47	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/18/2018 14:47	NH
Surr: 4-Bromofluorobenzene	99.2	68-127		%REC	260937	1	05/18/2018 14:47	NH
Surr: Dibromofluoromethane	109	84.4-122		%REC	260937	1	05/18/2018 14:47	NH
Surr: Toluene-d8	92.6	80.1-116		%REC	260937	1	05/18/2018 14:47	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-112
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 3:31:00 PM
Lab ID:	1805C21-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.0109	0.00500		mg/L	260637	1	05/16/2018 04:02	NG
Copper	0.0525	0.00200		mg/L	260637	1	05/16/2018 04:02	NG
Lead	BRL	0.00100		mg/L	260637	1	05/16/2018 04:02	NG
Zinc	2.69	0.200		mg/L	260637	20	05/17/2018 15:23	NG
ION SCAN SW9056A								
Nitrate	4.1	0.25		mg/L	R370118	1	05/11/2018 13:05	MP
Sulfate	410	10		mg/L	R370118	10	05/11/2018 14:51	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	10	05/20/2018 21:22	NG
Copper	0.0487	0.0200		mg/L	260691	10	05/20/2018 21:22	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 21:18	NG
Zinc	2.46	0.100		mg/L	260691	10	05/20/2018 21:22	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 20:10	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 20:10	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 20:10	SH
alpha-BHC	0.00084	0.000050		mg/L	260636	1	05/15/2018 20:10	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:10	SH
beta-BHC	0.00024	0.000050		mg/L	260636	1	05/16/2018 20:20	UH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/16/2018 20:20	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 20:10	SH
gamma-BHC	0.00018	0.000050		mg/L	260636	1	05/15/2018 20:10	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:10	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 20:10	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 20:10	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 20:10	SH
Surr: Decachlorobiphenyl	105	15.4-120		%REC	260636	1	05/15/2018 20:10	SH
Surr: Tetrachloro-m-xylene	89.6	37-126		%REC	260636	1	05/15/2018 20:10	SH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-105
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 11:50:00 AM
Lab ID:	1805C21-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260637	1	05/16/2018 04:08	NG
Copper	0.00408	0.00200		mg/L	260637	1	05/16/2018 04:08	NG
Lead	BRL	0.00100		mg/L	260637	1	05/16/2018 04:08	NG
Zinc	0.0135	0.0100		mg/L	260637	1	05/16/2018 04:08	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370118	1	05/11/2018 13:20	MP
Sulfate	360	10		mg/L	R370118	10	05/11/2018 15:51	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 21:25	NG
Copper	BRL	0.00500		mg/L	260691	10	05/20/2018 21:29	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 21:25	NG
Zinc	BRL	0.0500		mg/L	260691	10	05/20/2018 21:29	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 20:21	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 20:21	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 20:21	SH
alpha-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
beta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 20:21	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 20:21	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 20:21	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 20:21	SH
Surr: Decachlorobiphenyl	68.8	15.4-120		%REC	260636	1	05/15/2018 20:21	SH
Surr: Tetrachloro-m-xylene	87.4	37-126		%REC	260636	1	05/15/2018 20:21	SH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-115
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 2:35:00 PM
Lab ID:	1805C21-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/18/2018 15:13	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/18/2018 15:13	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/18/2018 15:13	NH
Acetone	BRL	0.050		mg/L	260937	1	05/18/2018 15:13	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/18/2018 15:13	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/18/2018 15:13	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/18/2018 15:13	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/18/2018 15:13	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/18/2018 15:13	NH
Surr: 4-Bromofluorobenzene	99.8	68-127		%REC	260937	1	05/18/2018 15:13	NH
Surr: Dibromofluoromethane	115	84.4-122		%REC	260937	1	05/18/2018 15:13	NH
Surr: Toluene-d8	93.9	80.1-116		%REC	260937	1	05/18/2018 15:13	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-115
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 2:35:00 PM
Lab ID:	1805C21-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260637	1	05/16/2018 04:15	NG
Copper	3.47	0.500		mg/L	260637	100	05/17/2018 15:30	NG
Lead	0.00175	0.00100		mg/L	260637	1	05/16/2018 04:15	NG
Zinc	8.36	1.00		mg/L	260637	100	05/17/2018 15:30	NG
ION SCAN SW9056A								
Nitrate	0.92	0.25		mg/L	R370118	1	05/11/2018 13:35	MP
Sulfate	620	10		mg/L	R370118	10	05/11/2018 16:06	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 21:31	NG
Copper	2.70	0.0200		mg/L	260691	10	05/20/2018 21:35	NG
Lead	0.00157	0.00100		mg/L	260691	1	05/17/2018 21:31	NG
Zinc	6.53	0.100		mg/L	260691	10	05/20/2018 21:35	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 20:32	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 20:32	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 20:32	SH
alpha-BHC	0.00025	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
beta-BHC	0.00029	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 20:32	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 20:32	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 20:32	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 20:32	SH
Surr: Decachlorobiphenyl	77.8	15.4-120		%REC	260636	1	05/15/2018 20:32	SH
Surr: Tetrachloro-m-xylene	80	37-126		%REC	260636	1	05/15/2018 20:32	SH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-117
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 4:30:00 PM
Lab ID:	1805C21-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 22:07	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 22:07	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 22:07	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 22:07	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 22:07	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 22:07	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 22:07	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 22:07	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 22:07	NH
Surr: 4-Bromofluorobenzene	98.7	68-127		%REC	260937	1	05/17/2018 22:07	NH
Surr: Dibromofluoromethane	91.9	84.4-122		%REC	260937	1	05/17/2018 22:07	NH
Surr: Toluene-d8	83.9	80.1-116		%REC	260937	1	05/17/2018 22:07	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-117
Project Name:	BFEL Atlanta	**Collection Date:**	5/10/2018 4:30:00 PM
Lab ID:	1805C21-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260637	1	05/16/2018 01:16	NG
Copper	0.0300	0.00200		mg/L	260637	1	05/16/2018 01:16	NG
Lead	0.00161	0.00100		mg/L	260637	1	05/16/2018 01:16	NG
Zinc	0.875	0.100		mg/L	260637	10	05/17/2018 14:30	NG
ION SCAN SW9056A								
Nitrate	3.9	0.25		mg/L	R370121	1	05/11/2018 12:47	MP
Sulfate	140	10		mg/L	R370121	10	05/11/2018 14:47	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 21:37	NG
Copper	0.0287	0.0200		mg/L	260691	10	05/20/2018 21:41	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 21:37	NG
Zinc	0.791	0.100		mg/L	260691	10	05/20/2018 21:41	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 20:43	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 20:43	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 20:43	SH
alpha-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
beta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 20:43	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 20:43	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 20:43	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 20:43	SH
Surr: Decachlorobiphenyl	93	15.4-120		%REC	260636	1	05/15/2018 20:43	SH
Surr: Tetrachloro-m-xylene	101	37-126		%REC	260636	1	05/15/2018 20:43	SH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 23-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: TW-11				**Lab ID:** 1805C21-002			
Collection Date: 5/10/2018 1:34:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.152		0.00186	0.00200	mg/L	260637	1
Zinc	0.594		0.00840	0.0500	mg/L	260637	5
ION SCAN SW9056A							
Nitrate	5.5		0.055	0.25	mg/L	R370118	1
Sulfate	190		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.148		0.0186	0.0200	mg/L	260691	10
Zinc	0.571		0.0168	0.100	mg/L	260691	10
Client Sample ID: MW-26				**Lab ID:** 1805C21-003			
Collection Date: 5/10/2018 4:20:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00840		0.00186	0.00200	mg/L	260637	1
Zinc	0.156		0.00168	0.0100	mg/L	260637	1
ION SCAN SW9056A							
Nitrate	3.6		0.055	0.25	mg/L	R370118	1
Sulfate	190		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.142		0.0168	0.100	mg/L	260691	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.000052		0.000018	0.000050	mg/L	260636	1
beta-BHC	0.00058		0.000015	0.000050	mg/L	260636	1
delta-BHC	0.000058		0.000014	0.000050	mg/L	260636	1
Client Sample ID: MW-108				**Lab ID:** 1805C21-004			
Collection Date: 5/10/2018 11:51:00 AM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.179		0.00186	0.00200	mg/L	260637	1
Zinc	2.37		0.0336	0.200	mg/L	260637	20
ION SCAN SW9056A							
Sulfate	260		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.198		0.0186	0.0200	mg/L	260691	10
Zinc	2.40		0.0168	0.100	mg/L	260691	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
4,4´-DDD	0.00014		0.000016	0.00010	mg/L	260636	1
alpha-BHC	0.00067		0.000018	0.000050	mg/L	260636	1
beta-BHC	0.0015		0.000015	0.000050	mg/L	260636	1
delta-BHC	0.00010		0.000014	0.000050	mg/L	260636	1
gamma-BHC	0.00029		0.000017	0.000050	mg/L	260636	1
Client Sample ID: MW-112				**Lab ID:** 1805C21-005			
Collection Date: 5/10/2018 3:31:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0109		0.00205	0.00500	mg/L	260637	1

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-112				**Lab ID:** 1805C21-005			
Collection Date: 5/10/2018 3:31:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0525		0.00186	0.00200	mg/L	260637	1
Zinc	2.69		0.0336	0.200	mg/L	260637	20
ION SCAN SW9056A							
Nitrate	4.1		0.055	0.25	mg/L	R370118	1
Sulfate	410		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0487		0.0186	0.0200	mg/L	260691	10
Zinc	2.46		0.0168	0.100	mg/L	260691	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00084		0.000018	0.000050	mg/L	260636	1
beta-BHC	0.00024		0.000015	0.000050	mg/L	260636	1
gamma-BHC	0.00018		0.000017	0.000050	mg/L	260636	1
Client Sample ID: MW-105				**Lab ID:** 1805C21-006			
Collection Date: 5/10/2018 11:50:00 AM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00408		0.00186	0.00200	mg/L	260637	1
Zinc	0.0135		0.00168	0.0100	mg/L	260637	1
ION SCAN SW9056A							
Sulfate	360		1.2	10	mg/L	R370118	10
Client Sample ID: MW-115				**Lab ID:** 1805C21-007			
Collection Date: 5/10/2018 2:35:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	3.47		0.186	0.500	mg/L	260637	100
Lead	0.00175		0.000621	0.00100	mg/L	260637	1
Zinc	8.36		0.168	1.00	mg/L	260637	100
ION SCAN SW9056A							
Nitrate	0.92		0.055	0.25	mg/L	R370118	1
Sulfate	620		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	2.70		0.0186	0.0200	mg/L	260691	10
Lead	0.00157		0.000621	0.00100	mg/L	260691	1
Zinc	6.53		0.0168	0.100	mg/L	260691	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00025		0.000018	0.000050	mg/L	260636	1
beta-BHC	0.00029		0.000015	0.000050	mg/L	260636	1
Client Sample ID: MW-117				**Lab ID:** 1805C21-008			
Collection Date: 5/10/2018 4:30:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0300		0.00186	0.00200	mg/L	260637	1
Lead	0.00161		0.000621	0.00100	mg/L	260637	1
Zinc	0.875		0.0168	0.100	mg/L	260637	10
ION SCAN SW9056A							

Analytical Environmental Services, Inc

Date: 23-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-117				**Lab ID:** 1805C21-008			
Collection Date: 5/10/2018 4:30:00 PM				**Matrix:** Groundwater			
ION SCAN SW9056A							
Nitrate	3.9		0.055	0.25	mg/L	R370121	1
Sulfate	140		1.2	10	mg/L	R370121	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0287		0.0186	0.0200	mg/L	260691	10
Zinc	0.791		0.0168	0.100	mg/L	260691	10

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Analytical Environmental Services, Inc

Date: 23-May-18

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805C21

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805C21-001A	TRIP BLANK-03	5/10/2018 12:00:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805C21-002A	TW-11	5/10/2018 1:34:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-002A	TW-11	5/10/2018 1:34:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/17/2018
1805C21-002B	TW-11	5/10/2018 1:34:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-002B	TW-11	5/10/2018 1:34:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-002C	TW-11	5/10/2018 1:34:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-002D	TW-11	5/10/2018 1:34:00PM	Groundwater	ION SCAN			05/11/2018
1805C21-003A	MW-26	5/10/2018 4:20:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805C21-003B	MW-26	5/10/2018 4:20:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-003C	MW-26	5/10/2018 4:20:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-003C	MW-26	5/10/2018 4:20:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-003D	MW-26	5/10/2018 4:20:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-003D	MW-26	5/10/2018 4:20:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805C21-003E	MW-26	5/10/2018 4:20:00PM	Groundwater	ION SCAN			05/11/2018
1805C21-004A	MW-108	5/10/2018 11:51:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805C21-004B	MW-108	5/10/2018 11:51:00AM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-004B	MW-108	5/10/2018 11:51:00AM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/17/2018
1805C21-004C	MW-108	5/10/2018 11:51:00AM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-004C	MW-108	5/10/2018 11:51:00AM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-004D	MW-108	5/10/2018 11:51:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-004D	MW-108	5/10/2018 11:51:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805C21-004E	MW-108	5/10/2018 11:51:00AM	Groundwater	ION SCAN			05/11/2018
1805C21-005A	MW-112	5/10/2018 3:31:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/18/2018
1805C21-005B	MW-112	5/10/2018 3:31:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-005B	MW-112	5/10/2018 3:31:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/17/2018
1805C21-005C	MW-112	5/10/2018 3:31:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-005C	MW-112	5/10/2018 3:31:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-005D	MW-112	5/10/2018 3:31:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-005D	MW-112	5/10/2018 3:31:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805C21

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805C21-005E	MW-112	5/10/2018 3:31:00PM	Groundwater	ION SCAN			05/11/2018
1805C21-006A	MW-105	5/10/2018 11:50:00AM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-006B	MW-105	5/10/2018 11:50:00AM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-006B	MW-105	5/10/2018 11:50:00AM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-006C	MW-105	5/10/2018 11:50:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-006D	MW-105	5/10/2018 11:50:00AM	Groundwater	ION SCAN			05/11/2018
1805C21-007A	MW-115	5/10/2018 2:35:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/18/2018
1805C21-007B	MW-115	5/10/2018 2:35:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-007B	MW-115	5/10/2018 2:35:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/17/2018
1805C21-007C	MW-115	5/10/2018 2:35:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-007C	MW-115	5/10/2018 2:35:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-007D	MW-115	5/10/2018 2:35:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-007E	MW-115	5/10/2018 2:35:00PM	Groundwater	ION SCAN			05/11/2018
1805C21-008A	MW-117	5/10/2018 4:30:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805C21-008B	MW-117	5/10/2018 4:30:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/16/2018
1805C21-008B	MW-117	5/10/2018 4:30:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:18:00PM	05/17/2018
1805C21-008C	MW-117	5/10/2018 4:30:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805C21-008C	MW-117	5/10/2018 4:30:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805C21-008D	MW-117	5/10/2018 4:30:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805C21-008E	MW-117	5/10/2018 4:30:00PM	Groundwater	ION SCAN			05/11/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260636

Sample ID: **MB-260636** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212739**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000406	0	0.0005		81.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000395	0	0.0005		79.0	37	126				

Sample ID: **LCS-260636** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212740**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000760	0.00010	0.0010		76.0	61.9	135				
Dieldrin	0.000833	0.00010	0.0010		83.3	70.3	126				
gamma-BHC	0.000928	0.000050	0.0010		92.8	70.9	129				
Heptachlor	0.000853	0.000050	0.0010		85.3	63.5	128				
Surr: Decachlorobiphenyl	0.000366	0	0.0005		73.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000409	0	0.0005		81.8	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260636

Sample ID: **1805C21-008DMS**	Client ID: **MW-117**	Units: **mg/L**	Prep Date: **05/15/2018**	Run No: **370465**
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **260636**	Analysis Date: **05/15/2018**	Seq No: **8212748**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001031	0.00010	0.0010		103	43.2	136				
Dieldrin	0.000985	0.00010	0.0010		98.5	44	139				
gamma-BHC	0.001118	0.000050	0.0010		112	53.8	141				
Heptachlor	0.001087	0.000050	0.0010		109	34.3	144				
Surr: Decachlorobiphenyl	0.000476	0	0.0005		95.3	15.4	120				
Surr: Tetrachloro-m-xylene	0.000540	0	0.0005		108	37	126				

Sample ID: **1805C21-008DMSD**	Client ID: **MW-117**	Units: **mg/L**	Prep Date: **05/15/2018**	Run No: **370465**
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **260636**	Analysis Date: **05/15/2018**	Seq No: **8212749**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000946	0.00010	0.0010		94.6	43.2	136	0.001031	8.53	21.1	
Dieldrin	0.000931	0.00010	0.0010		93.1	44	139	0.0009851	5.60	20	
gamma-BHC	0.001033	0.000050	0.0010		103	53.8	141	0.001118	7.94	20	
Heptachlor	0.000990	0.000050	0.0010		99.0	34.3	144	0.001087	9.36	24.4	
Surr: Decachlorobiphenyl	0.000419	0	0.0005		83.8	15.4	120	0.0004763	0	0	
Surr: Tetrachloro-m-xylene	0.000464	0	0.0005		92.8	37	126	0.0005395	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260637

Sample ID: **MB-260637** Client ID: Units: **mg/L** Prep Date: **05/14/2018** Run No: **370435**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260637** Analysis Date: **05/16/2018** Seq No: **8212262**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260637** Client ID: Units: **mg/L** Prep Date: **05/14/2018** Run No: **370435**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260637** Analysis Date: **05/16/2018** Seq No: **8212263**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1096	0.00500	0.1000		110	80	120				
Copper	0.1092	0.00200	0.1000		109	80	120				
Lead	0.1041	0.00100	0.1000		104	80	120				
Zinc	0.1053	0.0100	0.1000		105	80	120				

Sample ID: **1805C21-008BMS** Client ID: **MW-117** Units: **mg/L** Prep Date: **05/14/2018** Run No: **370435**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260637** Analysis Date: **05/16/2018** Seq No: **8212265**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1087	0.00500	0.1000		109	75	125				
Copper	0.1391	0.00200	0.1000	0.03005	109	75	125				
Lead	0.1012	0.00100	0.1000	0.001610	99.6	75	125				
Zinc	0.9734	0.0100	0.1000	0.8728	101	75	125				

Sample ID: **1805C21-008BMSD** Client ID: **MW-117** Units: **mg/L** Prep Date: **05/14/2018** Run No: **370435**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260637** Analysis Date: **05/16/2018** Seq No: **8212267**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1056	0.00500	0.1000		106	75	125	0.1087	2.93	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260637

Sample ID: **1805C21-008BMSD** Client ID: **MW-117** Units: **mg/L** Prep Date: **05/14/2018** Run No: **370435**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260637** Analysis Date: **05/16/2018** Seq No: **8212267**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1342	0.00200	0.1000	0.03005	104	75	125	0.1391	3.59	20	
Lead	0.09897	0.00100	0.1000	0.001610	97.4	75	125	0.1012	2.26	20	
Zinc	0.9334	0.0100	0.1000	0.8728	60.5	75	125	0.9734	4.20	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **MB-260691** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MBLK** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212028**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260691** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212029**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1040	0.00500	0.1000		104	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09671	0.00100	0.1000		96.7	80	120				
Zinc	0.1101	0.0100	0.1000	0.008288	102	80	120				

Sample ID: **1805882-003CMS** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212031**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1012	0.00500	0.1000		101	75	125				
Copper	0.1031	0.00200	0.1000	0.006266	96.9	75	125				
Lead	0.09112	0.00100	0.1000	0.0006851	90.4	75	125				
Zinc	0.2435	0.0100	0.1000	0.1583	85.2	75	125				

Sample ID: **1805882-003CMSD** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1042	0.00500	0.1000		104	75	125	0.1012	2.92	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **1805882-003CMSD** Client ID:
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1104	0.00200	0.1000	0.006266	104	75	125	0.1031	6.80	20	
Lead	0.09607	0.00100	0.1000	0.0006851	95.4	75	125	0.09112	5.29	20	
Zinc	0.2561	0.0100	0.1000	0.1583	97.9	75	125	0.2435	5.05	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **MB-260937** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8217987**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									
Styrene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **MB-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370641**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/17/2018**	Seq No: **8217987**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	0.0050									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04504	0	0.0500		90.1	68	127				
Surr: Dibromofluoromethane	0.04746	0	0.0500		94.9	84.4	122				
Surr: Toluene-d8	0.04608	0	0.0500		92.2	80.1	116				

Sample ID: **MB-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370641**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/17/2018**	Seq No: **8218300**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Isobutyl Alcohol	BRL	0.20									
Tetrahydrofuran	BRL	0.010									
Surr: 4-Bromofluorobenzene	0.05378	0	0.0500		108	68	127				
Surr: Dibromofluoromethane	0.05496	0	0.0500		110	84.4	122				
Surr: Toluene-d8	0.04988	0	0.0500		99.8	80.1	116				

Sample ID: **LCS-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370700**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/18/2018**	Seq No: **8219641**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04213	0.0050	0.0500		84.3	69	136				
Benzene	0.04467	0.0050	0.0500		89.3	73.7	126				
Chlorobenzene	0.05137	0.0050	0.0500	0.0007600	101	73.5	124				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **LCS-260937** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370700**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/18/2018** Seq No: **8219641**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	0.04858	0.0050	0.0500		97.2	76.8	125				
Trichloroethene	0.04865	0.0050	0.0500		97.3	70.9	124				
Surr: 4-Bromofluorobenzene	0.05057	0	0.0500		101	68	127				
Surr: Dibromofluoromethane	0.05740	0	0.0500		115	84.4	122				
Surr: Toluene-d8	0.04608	0	0.0500		92.2	80.1	116				

Sample ID: **1805D56-001AMS** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218029**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	435.0	50	500.0		87.0	65.7	143				
Benzene	425.2	50	500.0		85.0	66.1	137				
Chlorobenzene	466.1	50	500.0		93.2	70.9	132				
Toluene	469.8	50	500.0		94.0	63.8	141				
Trichloroethene	460.2	50	500.0		92.0	70.6	128				
Surr: 4-Bromofluorobenzene	514.6	0	500.0		103	68	127				
Surr: Dibromofluoromethane	541.6	0	500.0		108	84.4	122				
Surr: Toluene-d8	489.3	0	500.0		97.9	80.1	116				

Sample ID: **1805D56-001AMSD** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218030**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	379.5	50	500.0		75.9	65.7	143	435.0	13.6	17.7	
Benzene	417.9	50	500.0		83.6	66.1	137	425.2	1.73	20	
Chlorobenzene	467.5	50	500.0		93.5	70.9	132	466.1	0.300	20	
Toluene	476.1	50	500.0		95.2	63.8	141	469.8	1.33	20	
Trichloroethene	451.0	50	500.0		90.2	70.6	128	460.2	2.02	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **1805D56-001AMSD** Client ID:
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B**
Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218030**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: 4-Bromofluorobenzene	501.6	0	500.0		100	68	127	514.6	0	0	
Surr: Dibromofluoromethane	488.2	0	500.0		97.6	84.4	122	541.6	0	0	
Surr: Toluene-d8	495.5	0	500.0		99.1	80.1	116	489.3	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: R370118

Sample ID: **MB-R370118**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370118**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370118**		Analysis Date: **05/11/2018**		Seq No: **8203154**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370118**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370118**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370118**		Analysis Date: **05/11/2018**		Seq No: **8203153**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.091	0.25	5.000		102	90	110				
Sulfate	25.25	1.0	25.00		101	90	110				

Sample ID: **1805C90-001AMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370118**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370118**		Analysis Date: **05/11/2018**		Seq No: **8203173**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.776	0.25	5.000	0.3730	108	90	110				
Sulfate	25.31	1.0	25.00	0.5844	98.9	90	110				

Sample ID: **1805C90-003AMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370118**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370118**		Analysis Date: **05/11/2018**		Seq No: **8203175**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.013	0.25	5.000	0.4905	110	90	110				S
Sulfate	25.67	1.0	25.00	0.5120	101	90	110				

Sample ID: **1805C90-001AMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370118**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370118**		Analysis Date: **05/11/2018**		Seq No: **8203174**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.801	0.25	5.000	0.3730	109	90	110	5.776	0.437	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: R370118

Sample ID: **1805C90-001AMSD** Client ID:
SampleType: **MSD** TestCode: **ION SCAN SW9056A**
Units: **mg/L** Prep Date: Run No: **370118**
BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203174**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	25.46	1.0	25.00	0.5844	99.5	90	110	25.31	0.597	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: R370121

Sample ID: **MB-R370121**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370121**
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**			BatchID: **R370121**	Analysis Date: **05/11/2018**		Seq No: **8203221**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370121**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370121**
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370121**	Analysis Date: **05/11/2018**		Seq No: **8203220**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.304	0.25	5.000		106	90	110				
Sulfate	25.92	1.0	25.00		104	90	110				

Sample ID: **1805C21-008EMS**	Client ID: **MW-117**			Units: **mg/L**	Prep Date:		Run No: **370121**
SampleType: **MS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370121**	Analysis Date: **05/11/2018**		Seq No: **8203229**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	62.03	2.5	50.00	3.704	117	90	110				S
Sulfate	391.4	10	250.0	143.6	99.1	90	110				

Sample ID: **1805D34-002EMS**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370121**
SampleType: **MS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370121**	Analysis Date: **05/11/2018**		Seq No: **8203232**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	121.6	5.0	100.0	6.694	115	90	110				S
Sulfate	601.2	20	500.0	94.32	101	90	110				

Sample ID: **1805C21-008EMSD**	Client ID: **MW-117**			Units: **mg/L**	Prep Date:		Run No: **370121**
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**			BatchID: **R370121**	Analysis Date: **05/11/2018**		Seq No: **8203230**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	61.87	2.5	50.00	3.704	116	90	110	62.03	0.260	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805C21

ANALYTICAL QC SUMMARY REPORT

BatchID: R370121

Sample ID: **1805C21-008EMSD** Client ID: **MW-117** Units: **mg/L** Prep Date: Run No: **370121**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370121** Analysis Date: **05/11/2018** Seq No: **8203230**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	398.6	10	250.0	143.6	102	90	110	391.4	1.82	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

June 26, 2018

Rhonda Quinn
Wood Environment & Infrastructure
1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805D34

Analytical Environmental Services, Inc. received 5 samples on 5/11/2018 4:25:00 PM
for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar
Project Manager

Revision 6/26/2018

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805D34

Date: 5/11/18 Page 1 of 1

COMPANY: Wood E+IS

ADDRESS: 1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144

PHONE: 770-421-3400

EMAIL:

SAMPLED BY: D Howard, E Guillen, B Rhiner

SIGNATURE: Daniel L Howard

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	PRESERVATION (see codes) HT	N	H	I	H	ANALYSIS REQUESTED * VOCs 8260	* Tot metals 6020	Diss metals 6020	Test 8081A	Nitrate Sulfate 9056	REMARKS	Number of Containers
1	Trip Blank-04	5/11/18	0930	X		W	2											2
2	TW-2		1304	X		GW	2	1	1	2	1							7
3	MW-106D		1220	X		GW	2	1	1	2	1							7
4	MW-121		1430	X		GW	2	1	1	2	1							7
5	MW-110		13:31	X		GW	2	1	1	2	1							7
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY: DATE/TIME:
1. 5-11-18/1529
2. 5-11-18 1700
3.

RECEIVED BY: DATE/TIME:
1. 5-11-18 17:29
2. Essence Moore 5/11/18 4:05 pm
3.

SPECIAL INSTRUCTIONS/COMMENTS:
Lab will filter dissolved metals
*Metals: As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail courier Greyhound
other:

PROJECT INFORMATION
PROJECT NAME: BFEL Atlanta
PROJECT #: 612208054.28
SITE ADDRESS: 1525 Pine St Atlanta, GA
SEND REPORT TO: Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #: PO#:

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other

STATE PROGRAM (if any):
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ● III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: Wood Environment & Infrastructure
Project: BFEL Atlanta
Lab ID: 1805D34

Case Narrative

Dissolved Metals Analysis by Method 6020B:

Due to sample matrix, samples 1805D34-002C, -003C, and -004C required dilution during preparation and/or analysis resulting in elevated reporting limits.

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TRIP BLANK-04
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 9:30:00 AM
Lab ID:	1805D34-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 16:56	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 16:56	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 16:56	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 16:56	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 16:56	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 16:56	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 16:56	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 16:56	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 16:56	NH
Surr: 4-Bromofluorobenzene	111	68-127		%REC	260937	1	05/17/2018 16:56	NH
Surr: Dibromofluoromethane	98.9	84.4-122		%REC	260937	1	05/17/2018 16:56	NH
Surr: Toluene-d8	99.2	80.1-116		%REC	260937	1	05/17/2018 16:56	NH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TW-2
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 1:04:00 PM
Lab ID:	1805D34-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/18/2018 16:05	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/18/2018 16:05	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/18/2018 16:05	NH
Acetone	BRL	0.050		mg/L	260937	1	05/18/2018 16:05	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/18/2018 16:05	NH
Chloroform	0.0087	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
cis-1,2-Dichloroethene	0.017	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/18/2018 16:05	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Tetrachloroethene	0.016	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/18/2018 16:05	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Trichloroethene	0.019	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/18/2018 16:05	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/18/2018 16:05	NH
Surr: 4-Bromofluorobenzene	96.9	68-127		%REC	260937	1	05/18/2018 16:05	NH
Surr: Dibromofluoromethane	110	84.4-122		%REC	260937	1	05/18/2018 16:05	NH
Surr: Toluene-d8	92.6	80.1-116		%REC	260937	1	05/18/2018 16:05	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TW-2
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 1:04:00 PM
Lab ID:	1805D34-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260654	1	05/15/2018 15:56	DP
Copper	BRL	0.00200		mg/L	260654	1	05/15/2018 15:56	DP
Lead	BRL	0.00100		mg/L	260654	1	05/15/2018 15:56	DP
Zinc	0.0123	0.0100		mg/L	260654	1	05/15/2018 15:56	DP
ION SCAN SW9056A								
Nitrate	7.0	0.25		mg/L	R370121	1	05/11/2018 19:11	MP
Sulfate	94	1.0		mg/L	R370121	1	05/11/2018 19:11	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 22:03	NG
Copper	BRL	0.0100		mg/L	260691	5	05/20/2018 21:48	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 22:03	NG
Zinc	BRL	0.0500		mg/L	260691	5	05/20/2018 21:48	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 21:16	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 21:16	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 21:16	SH
alpha-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
beta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 21:16	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 21:16	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 21:16	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 21:16	SH
Surr: Decachlorobiphenyl	76.7	15.4-120		%REC	260636	1	05/15/2018 21:16	SH
Surr: Tetrachloro-m-xylene	87.6	37-126		%REC	260636	1	05/15/2018 21:16	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-106D
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 12:20:00 PM
Lab ID:	1805D34-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 22:59	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 22:59	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 22:59	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 22:59	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 22:59	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 22:59	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 22:59	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 22:59	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 22:59	NH
Surr: 4-Bromofluorobenzene	86	68-127		%REC	260937	1	05/17/2018 22:59	NH
Surr: Dibromofluoromethane	98.1	84.4-122		%REC	260937	1	05/17/2018 22:59	NH
Surr: Toluene-d8	95.2	80.1-116		%REC	260937	1	05/17/2018 22:59	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-106D
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 12:20:00 PM
Lab ID:	1805D34-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260654	1	05/15/2018 15:58	DP
Copper	0.00473	0.00200		mg/L	260654	1	05/15/2018 15:58	DP
Lead	BRL	0.00100		mg/L	260654	1	05/15/2018 15:58	DP
Zinc	0.205	0.0100		mg/L	260654	1	05/15/2018 15:58	DP
ION SCAN SW9056A								
Nitrate	0.42	0.25		mg/L	R370118	1	05/11/2018 19:30	MP
Sulfate	320	10		mg/L	R370118	10	05/11/2018 20:45	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 22:09	NG
Copper	BRL	0.0100		mg/L	260691	5	05/20/2018 21:54	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 22:09	NG
Zinc	0.206	0.0500		mg/L	260691	5	05/20/2018 21:54	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 21:28	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 21:28	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 21:28	SH
alpha-BHC	0.00063	0.000050		mg/L	260636	1	05/16/2018 20:31	UH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 21:28	SH
beta-BHC	0.00023	0.000050		mg/L	260636	1	05/16/2018 20:31	UH
delta-BHC	0.00066	0.000050		mg/L	260636	1	05/16/2018 20:31	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 21:28	SH
gamma-BHC	0.00038	0.000050		mg/L	260636	1	05/16/2018 20:31	UH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 21:28	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 21:28	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 21:28	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 21:28	SH
Surr: Decachlorobiphenyl	75.5	15.4-120		%REC	260636	1	05/15/2018 21:28	SH
Surr: Tetrachloro-m-xylene	80	37-126		%REC	260636	1	05/15/2018 21:28	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-121
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 2:30:00 PM
Lab ID:	1805D34-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 23:25	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 23:25	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 23:25	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 23:25	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 23:25	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 23:25	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 23:25	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 23:25	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 23:25	NH
Surr: 4-Bromofluorobenzene	89.6	68-127		%REC	260937	1	05/17/2018 23:25	NH
Surr: Dibromofluoromethane	98.4	84.4-122		%REC	260937	1	05/17/2018 23:25	NH
Surr: Toluene-d8	96.3	80.1-116		%REC	260937	1	05/17/2018 23:25	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-121
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 2:30:00 PM
Lab ID:	1805D34-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260654	1	05/15/2018 16:00	DP
Copper	0.00877	0.00200		mg/L	260654	1	05/15/2018 16:00	DP
Lead	BRL	0.00100		mg/L	260654	1	05/15/2018 16:00	DP
Zinc	0.0259	0.0100		mg/L	260654	1	05/15/2018 16:00	DP
ION SCAN SW9056A								
Nitrate	0.95	0.25		mg/L	R370118	1	05/11/2018 19:45	MP
Sulfate	46	1.0		mg/L	R370118	1	05/11/2018 19:45	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 22:15	NG
Copper	BRL	0.0100		mg/L	260691	5	05/20/2018 22:00	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 22:15	NG
Zinc	BRL	0.0500		mg/L	260691	5	05/20/2018 22:00	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 21:39	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 21:39	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 21:39	SH
alpha-BHC	0.00014	0.000050		mg/L	260636	1	05/15/2018 21:39	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 21:39	SH
beta-BHC	0.00010	0.000050		mg/L	260636	1	05/15/2018 21:39	SH
delta-BHC	0.00011	0.000050		mg/L	260636	1	05/16/2018 19:35	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 21:39	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 21:39	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 21:39	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 21:39	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 21:39	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 21:39	SH
Surr: Decachlorobiphenyl	67	15.4-120		%REC	260636	1	05/15/2018 21:39	SH
Surr: Tetrachloro-m-xylene	77	37-126		%REC	260636	1	05/15/2018 21:39	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-110
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 1:31:00 PM
Lab ID:	1805D34-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/18/2018 16:31	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/18/2018 16:31	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/18/2018 16:31	NH
Acetone	BRL	0.050		mg/L	260937	1	05/18/2018 16:31	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/18/2018 16:31	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/18/2018 16:31	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/18/2018 16:31	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/18/2018 16:31	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/18/2018 16:31	NH
Surr: 4-Bromofluorobenzene	101	68-127		%REC	260937	1	05/18/2018 16:31	NH
Surr: Dibromofluoromethane	115	84.4-122		%REC	260937	1	05/18/2018 16:31	NH
Surr: Toluene-d8	94	80.1-116		%REC	260937	1	05/18/2018 16:31	NH
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-110
Project Name:	BFEL Atlanta	**Collection Date:**	5/11/2018 1:31:00 PM
Lab ID:	1805D34-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260654	1	05/15/2018 16:02	DP
Copper	0.386	0.00200		mg/L	260654	1	05/15/2018 16:02	DP
Lead	BRL	0.00100		mg/L	260654	1	05/15/2018 16:02	DP
Zinc	5.26	0.0100		mg/L	260654	1	05/15/2018 16:02	DP
ION SCAN SW9056A								
Nitrate	2.3	0.25		mg/L	R370118	1	05/11/2018 20:00	MP
Sulfate	320	10		mg/L	R370118	10	05/11/2018 21:15	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/17/2018 22:21	NG
Copper	0.396	0.0200		mg/L	260691	10	05/20/2018 22:26	NG
Lead	BRL	0.00100		mg/L	260691	1	05/17/2018 22:21	NG
Zinc	5.19	0.100		mg/L	260691	10	05/20/2018 22:26	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 23:20	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 23:20	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 23:20	SH
alpha-BHC	0.00042	0.000050		mg/L	260636	1	05/16/2018 20:43	UH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:20	SH
beta-BHC	0.00052	0.000050		mg/L	260636	1	05/15/2018 23:20	SH
delta-BHC	0.00070	0.000050		mg/L	260636	1	05/16/2018 20:43	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 23:20	SH
gamma-BHC	0.00043	0.000050		mg/L	260636	1	05/16/2018 20:43	UH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:20	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 23:20	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 23:20	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 23:20	SH
Surr: Decachlorobiphenyl	64.4	15.4-120		%REC	260636	1	05/15/2018 23:20	SH
Surr: Tetrachloro-m-xylene	78.5	37-126		%REC	260636	1	05/15/2018 23:20	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: TW-2				**Lab ID:** 1805D34-002			
Collection Date: 5/11/2018 1:04:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Chloroform	0.0087		0.00020	0.0050	mg/L	260937	1
cis-1,2-Dichloroethene	0.017		0.00028	0.0050	mg/L	260937	1
Tetrachloroethene	0.016		0.00046	0.0050	mg/L	260937	1
Trichloroethene	0.019		0.00030	0.0050	mg/L	260937	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.0123		0.00168	0.0100	mg/L	260654	1
ION SCAN SW9056A							
Nitrate	7.0		0.055	0.25	mg/L	R370121	1
Sulfate	94		0.12	1.0	mg/L	R370121	1
Client Sample ID: MW-106D				**Lab ID:** 1805D34-003			
Collection Date: 5/11/2018 12:20:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00473		0.00186	0.00200	mg/L	260654	1
Zinc	0.205		0.00168	0.0100	mg/L	260654	1
ION SCAN SW9056A							
Nitrate	0.42		0.055	0.25	mg/L	R370118	1
Sulfate	320		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.206		0.00840	0.0500	mg/L	260691	5
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00063		0.000018	0.000050	mg/L	260636	1
beta-BHC	0.00023		0.000015	0.000050	mg/L	260636	1
delta-BHC	0.00066		0.000014	0.000050	mg/L	260636	1
gamma-BHC	0.00038		0.000017	0.000050	mg/L	260636	1
Client Sample ID: MW-121				**Lab ID:** 1805D34-004			
Collection Date: 5/11/2018 2:30:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00877		0.00186	0.00200	mg/L	260654	1
Zinc	0.0259		0.00168	0.0100	mg/L	260654	1
ION SCAN SW9056A							
Nitrate	0.95		0.055	0.25	mg/L	R370118	1
Sulfate	46		0.12	1.0	mg/L	R370118	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00014		0.000010	0.000050	mg/L	260636	1
beta-BHC	0.00010		0.000004	0.000050	mg/L	260636	1
delta-BHC	0.00011		0.000014	0.000050	mg/L	260636	1
Client Sample ID: MW-110				**Lab ID:** 1805D34-005			
Collection Date: 5/11/2018 1:31:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.386		0.00186	0.00200	mg/L	260654	1
Zinc	5.26		0.00168	0.0100	mg/L	260654	1
ION SCAN SW9056A							

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-110				**Lab ID:** 1805D34-005			
Collection Date: 5/11/2018 1:31:00 PM				**Matrix:** Groundwater			
ION SCAN SW9056A							
Nitrate	2.3		0.055	0.25	mg/L	R370118	1
Sulfate	320		1.2	10	mg/L	R370118	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.396		0.0186	0.0200	mg/L	260691	10
Zinc	5.19		0.0168	0.100	mg/L	260691	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00042		0.000018	0.000050	mg/L	260636	1
beta-BHC	0.00052		0.000004	0.000050	mg/L	260636	1
delta-BHC	0.00070		0.000014	0.000050	mg/L	260636	1
gamma-BHC	0.00043		0.000017	0.000050	mg/L	260636	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Lab Order: 1805D34

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805D34-001A	TRIP BLANK-04	5/11/2018 9:30:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805D34-002A	TW-2	5/11/2018 1:04:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/18/2018
1805D34-002B	TW-2	5/11/2018 1:04:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:57:00PM	05/15/2018
1805D34-002C	TW-2	5/11/2018 1:04:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805D34-002C	TW-2	5/11/2018 1:04:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805D34-002D	TW-2	5/11/2018 1:04:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805D34-002E	TW-2	5/11/2018 1:04:00PM	Groundwater	ION SCAN			05/11/2018
1805D34-003A	MW-106D	5/11/2018 12:20:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805D34-003B	MW-106D	5/11/2018 12:20:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:57:00PM	05/15/2018
1805D34-003C	MW-106D	5/11/2018 12:20:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805D34-003C	MW-106D	5/11/2018 12:20:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805D34-003D	MW-106D	5/11/2018 12:20:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805D34-003D	MW-106D	5/11/2018 12:20:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805D34-003E	MW-106D	5/11/2018 12:20:00PM	Groundwater	ION SCAN			05/11/2018
1805D34-004A	MW-121	5/11/2018 2:30:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805D34-004B	MW-121	5/11/2018 2:30:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:57:00PM	05/15/2018
1805D34-004C	MW-121	5/11/2018 2:30:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805D34-004C	MW-121	5/11/2018 2:30:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805D34-004D	MW-121	5/11/2018 2:30:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805D34-004D	MW-121	5/11/2018 2:30:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805D34-004E	MW-121	5/11/2018 2:30:00PM	Groundwater	ION SCAN			05/11/2018
1805D34-005A	MW-110	5/11/2018 1:31:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/18/2018
1805D34-005B	MW-110	5/11/2018 1:31:00PM	Groundwater	Total Metals by ICP/MS		5/14/2018 4:57:00PM	05/15/2018
1805D34-005C	MW-110	5/11/2018 1:31:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/17/2018
1805D34-005C	MW-110	5/11/2018 1:31:00PM	Groundwater	Dissolved Metals by ICP/MS		5/16/2018 10:15:00AM	05/20/2018
1805D34-005D	MW-110	5/11/2018 1:31:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805D34-005D	MW-110	5/11/2018 1:31:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805D34-005E	MW-110	5/11/2018 1:31:00PM	Groundwater	ION SCAN			05/11/2018

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260636

Sample ID: **MB-260636** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212739**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000406	0	0.0005		81.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000395	0	0.0005		79.0	37	126				

Sample ID: **LCS-260636** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212740**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000760	0.00010	0.0010		76.0	61.9	135				
Dieldrin	0.000833	0.00010	0.0010		83.3	70.3	126				
gamma-BHC	0.000928	0.000050	0.0010		92.8	70.9	129				
Heptachlor	0.000853	0.000050	0.0010		85.3	63.5	128				
Surr: Decachlorobiphenyl	0.000366	0	0.0005		73.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000409	0	0.0005		81.8	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260636

Sample ID: **1805C21-008DMS** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212748**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001031	0.00010	0.0010		103	43.2	136				
Dieldrin	0.000985	0.00010	0.0010		98.5	44	139				
gamma-BHC	0.001118	0.000050	0.0010		112	53.8	141				
Heptachlor	0.001087	0.000050	0.0010		109	34.3	144				
Surr: Decachlorobiphenyl	0.000476	0	0.0005		95.3	15.4	120				
Surr: Tetrachloro-m-xylene	0.000540	0	0.0005		108	37	126				

Sample ID: **1805C21-008DMSD** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MSD** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212749**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000946	0.00010	0.0010		94.6	43.2	136	0.001031	8.53	21.1	
Dieldrin	0.000931	0.00010	0.0010		93.1	44	139	0.0009851	5.60	20	
gamma-BHC	0.001033	0.000050	0.0010		103	53.8	141	0.001118	7.94	20	
Heptachlor	0.000990	0.000050	0.0010		99.0	34.3	144	0.001087	9.36	24.4	
Surr: Decachlorobiphenyl	0.000419	0	0.0005		83.8	15.4	120	0.0004763	0	0	
Surr: Tetrachloro-m-xylene	0.000464	0	0.0005		92.8	37	126	0.0005395	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260654

Sample ID: **MB-260654** Client ID: Units: **mg/L** Prep Date: **05/14/2018** Run No: **370372**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260654** Analysis Date: **05/15/2018** Seq No: **8210152**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260654** Client ID: Units: **mg/L** Prep Date: **05/14/2018** Run No: **370372**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260654** Analysis Date: **05/15/2018** Seq No: **8210154**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1130	0.00500	0.1000		113	80	120				
Copper	0.1117	0.00200	0.1000		112	80	120				
Lead	0.1056	0.00100	0.1000		106	80	120				
Zinc	0.1011	0.0100	0.1000		101	80	120				

Sample ID: **1805E14-001BMS** Client ID: Units: **mg/L** Prep Date: **05/14/2018** Run No: **370372**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260654** Analysis Date: **05/15/2018** Seq No: **8210157**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09967	0.00500	0.1000		99.7	75	125				
Copper	0.09790	0.00200	0.1000		97.9	75	125				
Lead	0.1070	0.00100	0.1000	0.003376	104	75	125				
Zinc	0.09846	0.0100	0.1000	0.002615	95.8	75	125				

Sample ID: **1805E14-001BMSD** Client ID: Units: **mg/L** Prep Date: **05/14/2018** Run No: **370372**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260654** Analysis Date: **05/15/2018** Seq No: **8210158**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09936	0.00500	0.1000		99.4	75	125	0.09967	0.309	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260654

Sample ID: **1805E14-001BMSD** Client ID:
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/14/2018** Run No: **370372**
BatchID: **260654** Analysis Date: **05/15/2018** Seq No: **8210158**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.09606	0.00200	0.1000		96.1	75	125	0.09790	1.90	20	
Lead	0.1045	0.00100	0.1000	0.003376	101	75	125	0.1070	2.36	20	
Zinc	0.09655	0.0100	0.1000	0.002615	93.9	75	125	0.09846	1.95	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **MB-260691** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MBLK** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212028**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260691** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212029**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1040	0.00500	0.1000		104	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09671	0.00100	0.1000		96.7	80	120				
Zinc	0.1101	0.0100	0.1000	0.008288	102	80	120				

Sample ID: **1805882-003CMS** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212031**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1012	0.00500	0.1000		101	75	125				
Copper	0.1031	0.00200	0.1000	0.006266	96.9	75	125				
Lead	0.09112	0.00100	0.1000	0.0006851	90.4	75	125				
Zinc	0.2435	0.0100	0.1000	0.1583	85.2	75	125				

Sample ID: **1805882-003CMSD** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1042	0.00500	0.1000		104	75	125	0.1012	2.92	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **1805882-003CMSD** Client ID:
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1104	0.00200	0.1000	0.006266	104	75	125	0.1031	6.80	20	
Lead	0.09607	0.00100	0.1000	0.0006851	95.4	75	125	0.09112	5.29	20	
Zinc	0.2561	0.0100	0.1000	0.1583	97.9	75	125	0.2435	5.05	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **MB-260937** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8217987**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									
Styrene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **MB-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370641**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/17/2018**	Seq No: **8217987**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	0.0050									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04504	0	0.0500		90.1	68	127				
Surr: Dibromofluoromethane	0.04746	0	0.0500		94.9	84.4	122				
Surr: Toluene-d8	0.04608	0	0.0500		92.2	80.1	116				

Sample ID: **MB-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370641**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/17/2018**	Seq No: **8218300**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Isobutyl Alcohol	BRL	0.20									
Tetrahydrofuran	BRL	0.010									
Surr: 4-Bromofluorobenzene	0.05378	0	0.0500		108	68	127				
Surr: Dibromofluoromethane	0.05496	0	0.0500		110	84.4	122				
Surr: Toluene-d8	0.04988	0	0.0500		99.8	80.1	116				

Sample ID: **LCS-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370700**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/18/2018**	Seq No: **8219641**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04213	0.0050	0.0500		84.3	69	136				
Benzene	0.04467	0.0050	0.0500		89.3	73.7	126				
Chlorobenzene	0.05137	0.0050	0.0500	0.0007600	101	73.5	124				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **LCS-260937** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370700**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/18/2018** Seq No: **8219641**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	0.04858	0.0050	0.0500		97.2	76.8	125				
Trichloroethene	0.04865	0.0050	0.0500		97.3	70.9	124				
Surr: 4-Bromofluorobenzene	0.05057	0	0.0500		101	68	127				
Surr: Dibromofluoromethane	0.05740	0	0.0500		115	84.4	122				
Surr: Toluene-d8	0.04608	0	0.0500		92.2	80.1	116				

Sample ID: **1805D56-001AMS** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218029**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	435.0	50	500.0		87.0	65.7	143				
Benzene	425.2	50	500.0		85.0	66.1	137				
Chlorobenzene	466.1	50	500.0		93.2	70.9	132				
Toluene	469.8	50	500.0		94.0	63.8	141				
Trichloroethene	460.2	50	500.0		92.0	70.6	128				
Surr: 4-Bromofluorobenzene	514.6	0	500.0		103	68	127				
Surr: Dibromofluoromethane	541.6	0	500.0		108	84.4	122				
Surr: Toluene-d8	489.3	0	500.0		97.9	80.1	116				

Sample ID: **1805D56-001AMSD** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218030**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	379.5	50	500.0		75.9	65.7	143	435.0	13.6	17.7	
Benzene	417.9	50	500.0		83.6	66.1	137	425.2	1.73	20	
Chlorobenzene	467.5	50	500.0		93.5	70.9	132	466.1	0.300	20	
Toluene	476.1	50	500.0		95.2	63.8	141	469.8	1.33	20	
Trichloroethene	451.0	50	500.0		90.2	70.6	128	460.2	2.02	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **1805D56-001AMSD** Client ID:
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B**
Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218030**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: 4-Bromofluorobenzene	501.6	0	500.0		100	68	127	514.6	0	0	
Surr: Dibromofluoromethane	488.2	0	500.0		97.6	84.4	122	541.6	0	0	
Surr: Toluene-d8	495.5	0	500.0		99.1	80.1	116	489.3	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: R370118

Sample ID: **MB-R370118** Client ID: Units: **mg/L** Prep Date: Run No: **370118**
SampleType: **MBLK** TestCode: **ION SCAN SW9056A** BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203154**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370118** Client ID: Units: **mg/L** Prep Date: Run No: **370118**
SampleType: **LCS** TestCode: **ION SCAN SW9056A** BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203153**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.091	0.25	5.000		102	90	110				
Sulfate	25.25	1.0	25.00		101	90	110				

Sample ID: **1805C90-001AMS** Client ID: Units: **mg/L** Prep Date: Run No: **370118**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203173**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.776	0.25	5.000	0.3730	108	90	110				
Sulfate	25.31	1.0	25.00	0.5844	98.9	90	110				

Sample ID: **1805C90-003AMS** Client ID: Units: **mg/L** Prep Date: Run No: **370118**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203175**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.013	0.25	5.000	0.4905	110	90	110				S
Sulfate	25.67	1.0	25.00	0.5120	101	90	110				

Sample ID: **1805C90-001AMSD** Client ID: Units: **mg/L** Prep Date: Run No: **370118**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203174**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.801	0.25	5.000	0.3730	109	90	110	5.776	0.437	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: R370118

Sample ID: **1805C90-001AMSD** Client ID:
SampleType: **MSD** TestCode: **ION SCAN SW9056A**
Units: **mg/L** Prep Date: Run No: **370118**
BatchID: **R370118** Analysis Date: **05/11/2018** Seq No: **8203174**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	25.46	1.0	25.00	0.5844	99.5	90	110	25.31	0.597	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: R370121

Sample ID: **MB-R370121**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370121**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370121**		Analysis Date: **05/11/2018**		Seq No: **8203221**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370121**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370121**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370121**		Analysis Date: **05/11/2018**		Seq No: **8203220**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.304	0.25	5.000		106	90	110				
Sulfate	25.92	1.0	25.00		104	90	110				

Sample ID: **1805C21-008EMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370121**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370121**		Analysis Date: **05/11/2018**		Seq No: **8203229**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	62.03	2.5	50.00	3.704	117	90	110				S
Sulfate	391.4	10	250.0	143.6	99.1	90	110				

Sample ID: **1805D34-002EMS**	Client ID: **TW-2**				Units: **mg/L**		Prep Date:		Run No: **370121**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370121**		Analysis Date: **05/11/2018**		Seq No: **8203232**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	121.6	5.0	100.0	6.694	115	90	110				S
Sulfate	601.2	20	500.0	94.32	101	90	110				

Sample ID: **1805C21-008EMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370121**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370121**		Analysis Date: **05/11/2018**		Seq No: **8203230**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	61.87	2.5	50.00	3.704	116	90	110	62.03	0.260	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805D34

ANALYTICAL QC SUMMARY REPORT

BatchID: R370121

Sample ID: **1805C21-008EMSD** Client ID: Units: **mg/L** Prep Date: Run No: **370121**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370121** Analysis Date: **05/11/2018** Seq No: **8203230**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	398.6	10	250.0	143.6	102	90	110	391.4	1.82	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

AES

June 26, 2018

Rhonda Quinn
Wood Environment & Infrastructure
1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805E48

Analytical Environmental Services, Inc. received 6 samples on 5/14/2018 5:17:00 PM
for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar
Project Manager

Revision 6/26/2018

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805E48

Date: 5-14-18 Page 1 of 1

COMPANY: WOOD E&IS

ADDRESS: 1075 BIG SHANTY RD #100 KENNESAW, GA

PHONE: 770 421 3400

EMAIL:

SAMPLED BY: E. GUILLEN, B. RHIRER, D. HOWARD

SIGNATURE:

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	ANALYSIS REQUESTED: VOC LIST 8260	TOTAL METALS 6020 *	DISSOLVED METALS 6020 *	PESTICIDES 8081A	NITRATE-SULFATE 9056	REMARKS	Number of Containers
	PRESERVATION (see codes)												
1	TRIP BLANK	5-14-18	900	X		W	2						2
2	DUP-2	5-14-18	1200	X		GW					1		1
3	MW-116	5-14-18	1151	X		GW	2	1	1	2	1		7
4	MW-113	5-14-18	1210	X		GW	2	1	1	2	1		7
5	MW-114	5-14-18	1610	X		GW	2	1	1	2	1		7
6	OW-1	5-14-18	1601	X		GW	2	1	1	2	1		7
7													
8													
9													
10													
11													
12													
13													
14													

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1.	5-14-18/1645	1.	5-14-18 4:45
2.	5-14-18 5:17	2.	
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:
LAB WILL FILTER DISSOLVED METALS (See METALS LIST)
* As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail (courier) Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: BFEL ATLANTA
PROJECT #: 6122 08 0154.28
SITE ADDRESS: 1525 PINE ST. ATLANTA, GA
SEND REPORT TO: RHONDA QUINN
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ○ III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: Wood Environment & Infrastructure
Project: BFEL Atlanta
Lab ID: 1805E48

Case Narrative

Metals Analysis by Method 6020B:

Due to sample matrix, sample 1805E448-006B required dilution during preparation and/or analysis resulting in elevated reporting limits.

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TRIP BLANK
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018
Lab ID:	1805E48-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/17/2018 17:22	NH
2-Butanone	BRL	0.050		mg/L	260937	1	05/17/2018 17:22	NH
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/17/2018 17:22	NH
Acetone	BRL	0.050		mg/L	260937	1	05/17/2018 17:22	NH
Benzene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Chloroethane	BRL	0.010		mg/L	260937	1	05/17/2018 17:22	NH
Chloroform	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Chloromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/17/2018 17:22	NH
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Naphthalene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Styrene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/17/2018 17:22	NH
Toluene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/17/2018 17:22	NH
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/17/2018 17:22	NH
Surr: 4-Bromofluorobenzene	102	68-127		%REC	260937	1	05/17/2018 17:22	NH
Surr: Dibromofluoromethane	103	84.4-122		%REC	260937	1	05/17/2018 17:22	NH
Surr: Toluene-d8	102	80.1-116		%REC	260937	1	05/17/2018 17:22	NH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	DUP-2
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 12:00:00 PM
Lab ID:	1805E48-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
ION SCAN SW9056A								
Nitrate	2.6	0.25		mg/L	R370499	1	05/15/2018 11:47	MP
Sulfate	1100	20		mg/L	R370499	20	05/15/2018 13:01	MP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-116
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 11:51:00 AM
Lab ID:	1805E48-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/22/2018 21:42	NP
2-Butanone	BRL	0.050		mg/L	260937	1	05/22/2018 21:42	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/22/2018 21:42	NP
Acetone	BRL	0.050		mg/L	260937	1	05/22/2018 21:42	NP
Benzene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Chloroethane	BRL	0.010		mg/L	260937	1	05/22/2018 21:42	NP
Chloroform	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Chloromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/22/2018 21:42	NP
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Naphthalene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Styrene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/22/2018 21:42	NP
Toluene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/22/2018 21:42	NP
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/22/2018 21:42	NP
Surr: 4-Bromofluorobenzene	99.3	68-127		%REC	260937	1	05/22/2018 21:42	NP
Surr: Dibromofluoromethane	98.6	84.4-122		%REC	260937	1	05/22/2018 21:42	NP
Surr: Toluene-d8	100	80.1-116		%REC	260937	1	05/22/2018 21:42	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-116
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 11:51:00 AM
Lab ID:	1805E48-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260913	1	05/19/2018 02:01	NG
Copper	2.19	0.400		mg/L	260913	200	05/25/2018 19:05	NG
Lead	BRL	0.00100		mg/L	260913	1	05/19/2018 02:01	NG
Zinc	4.59	0.0100		mg/L	260913	1	05/19/2018 02:01	NG
ION SCAN SW9056A								
Nitrate	16	2.5		mg/L	R370499	10	05/15/2018 13:16	MP
Sulfate	510	10		mg/L	R370499	10	05/15/2018 13:16	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 06:26	NG
Copper	1.72	0.00200		mg/L	260890	1	05/19/2018 06:26	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 06:26	NG
Zinc	4.87	0.0100		mg/L	260890	1	05/19/2018 06:26	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 23:31	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 23:31	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 23:31	SH
alpha-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
beta-BHC	0.00020	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
delta-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 23:31	SH
gamma-BHC	BRL	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 23:31	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 23:31	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 23:31	SH
Surr: Decachlorobiphenyl	49.9	15.4-120		%REC	260636	1	05/15/2018 23:31	SH
Surr: Tetrachloro-m-xylene	67.7	37-126		%REC	260636	1	05/15/2018 23:31	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-113
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 12:10:00 PM
Lab ID:	1805E48-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/22/2018 22:08	NP
2-Butanone	BRL	0.050		mg/L	260937	1	05/22/2018 22:08	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/22/2018 22:08	NP
Acetone	BRL	0.050		mg/L	260937	1	05/22/2018 22:08	NP
Benzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Chloroethane	BRL	0.010		mg/L	260937	1	05/22/2018 22:08	NP
Chloroform	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Chloromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
cis-1,2-Dichloroethene	0.046	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/22/2018 22:08	NP
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Naphthalene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Styrene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/22/2018 22:08	NP
Toluene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Trichloroethene	0.026	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/22/2018 22:08	NP
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/22/2018 22:08	NP
Surr: 4-Bromofluorobenzene	97.4	68-127		%REC	260937	1	05/22/2018 22:08	NP
Surr: Dibromofluoromethane	97.2	84.4-122		%REC	260937	1	05/22/2018 22:08	NP
Surr: Toluene-d8	99.9	80.1-116		%REC	260937	1	05/22/2018 22:08	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-113
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 12:10:00 PM
Lab ID:	1805E48-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.00555	0.00500		mg/L	260913	1	05/19/2018 02:14	NG
Copper	10.4	1.00		mg/L	260913	500	05/25/2018 19:12	NG
Lead	0.00519	0.00100		mg/L	260913	1	05/19/2018 02:14	NG
Zinc	57.5	0.200		mg/L	260913	20	05/19/2018 02:08	NG
ION SCAN SW9056A								
Nitrate	2.6	0.25		mg/L	R370499	1	05/15/2018 12:32	MP
Sulfate	1000	20		mg/L	R370499	20	05/15/2018 13:31	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.00585	0.00500		mg/L	260890	1	05/19/2018 06:57	NG
Copper	9.08	0.200		mg/L	260890	100	05/24/2018 15:39	DP
Lead	0.00506	0.00100		mg/L	260890	1	05/19/2018 06:57	NG
Zinc	70.0	1.00		mg/L	260890	100	05/24/2018 15:39	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 23:42	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 23:42	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 23:42	SH
alpha-BHC	0.00010	0.000050		mg/L	260636	1	05/15/2018 23:42	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:42	SH
beta-BHC	0.00039	0.000050		mg/L	260636	1	05/15/2018 23:42	SH
delta-BHC	0.000096	0.000050		mg/L	260636	1	05/16/2018 19:47	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 23:42	SH
gamma-BHC	0.00015	0.000050		mg/L	260636	1	05/15/2018 23:42	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:42	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 23:42	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 23:42	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 23:42	SH
Surr: Decachlorobiphenyl	71.6	15.4-120		%REC	260636	1	05/15/2018 23:42	SH
Surr: Tetrachloro-m-xylene	34.1	37-126	S	%REC	260636	1	05/15/2018 23:42	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-114
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 4:10:00 PM
Lab ID:	1805E48-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/22/2018 22:34	NP
2-Butanone	BRL	0.050		mg/L	260937	1	05/22/2018 22:34	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/22/2018 22:34	NP
Acetone	BRL	0.050		mg/L	260937	1	05/22/2018 22:34	NP
Benzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Chlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Chloroethane	BRL	0.010		mg/L	260937	1	05/22/2018 22:34	NP
Chloroform	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Chloromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/22/2018 22:34	NP
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Naphthalene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Styrene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/22/2018 22:34	NP
Toluene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/22/2018 22:34	NP
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/22/2018 22:34	NP
Surr: 4-Bromofluorobenzene	91.9	68-127		%REC	260937	1	05/22/2018 22:34	NP
Surr: Dibromofluoromethane	97.3	84.4-122		%REC	260937	1	05/22/2018 22:34	NP
Surr: Toluene-d8	101	80.1-116		%REC	260937	1	05/22/2018 22:34	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-114
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 4:10:00 PM
Lab ID:	1805E48-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260913	1	05/19/2018 02:26	NG
Copper	1.93	0.200		mg/L	260913	100	05/25/2018 19:18	NG
Lead	0.00197	0.00100		mg/L	260913	1	05/19/2018 02:26	NG
Zinc	8.47	0.100		mg/L	260913	10	05/19/2018 02:20	NG
ION SCAN SW9056A								
Nitrate	25	2.5		mg/L	R370490	10	05/15/2018 13:02	MP
Sulfate	510	10		mg/L	R370490	10	05/15/2018 13:02	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 07:03	NG
Copper	1.36	0.00200		mg/L	260890	1	05/19/2018 07:03	NG
Lead	0.00138	0.00100		mg/L	260890	1	05/19/2018 07:03	NG
Zinc	9.36	0.500		mg/L	260890	50	05/24/2018 15:41	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/15/2018 23:54	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/15/2018 23:54	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/15/2018 23:54	SH
alpha-BHC	0.00019	0.000050		mg/L	260636	1	05/15/2018 23:54	SH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:54	SH
beta-BHC	0.0013	0.000050		mg/L	260636	1	05/15/2018 23:54	SH
delta-BHC	0.000082	0.000050		mg/L	260636	1	05/16/2018 19:58	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/15/2018 23:54	SH
gamma-BHC	0.000086	0.000050		mg/L	260636	1	05/15/2018 23:54	SH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/15/2018 23:54	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/15/2018 23:54	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/15/2018 23:54	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/15/2018 23:54	SH
Surr: Decachlorobiphenyl	63.3	15.4-120		%REC	260636	1	05/15/2018 23:54	SH
Surr: Tetrachloro-m-xylene	57.7	37-126		%REC	260636	1	05/15/2018 23:54	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	OW-1
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 4:01:00 PM
Lab ID:	1805E48-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
1,4-Dioxane	BRL	0.15		mg/L	260937	1	05/22/2018 23:00	NP
2-Butanone	BRL	0.050		mg/L	260937	1	05/22/2018 23:00	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	260937	1	05/22/2018 23:00	NP
Acetone	BRL	0.050		mg/L	260937	1	05/22/2018 23:00	NP
Benzene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Carbon disulfide	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Carbon tetrachloride	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Chlorobenzene	0.041	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Chloroethane	BRL	0.010		mg/L	260937	1	05/22/2018 23:00	NP
Chloroform	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Chloromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Cyclohexane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Ethylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Isobutyl Alcohol	BRL	0.20		mg/L	260937	1	05/22/2018 23:00	NP
Isopropylbenzene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Methylene chloride	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Naphthalene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Styrene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Tetrachloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Tetrahydrofuran	BRL	0.010		mg/L	260937	1	05/22/2018 23:00	NP
Toluene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Trichloroethene	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Vinyl chloride	BRL	0.0020		mg/L	260937	1	05/22/2018 23:00	NP
Xylenes, Total	BRL	0.0050		mg/L	260937	1	05/22/2018 23:00	NP
Surr: 4-Bromofluorobenzene	100	68-127		%REC	260937	1	05/22/2018 23:00	NP
Surr: Dibromofluoromethane	97.8	84.4-122		%REC	260937	1	05/22/2018 23:00	NP
Surr: Toluene-d8	101	80.1-116		%REC	260937	1	05/22/2018 23:00	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	OW-1
Project Name:	BFEL Atlanta	**Collection Date:**	5/14/2018 4:01:00 PM
Lab ID:	1805E48-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.126	0.00500		mg/L	260913	1	05/19/2018 02:33	NG
Copper	BRL	0.200		mg/L	260913	100	05/25/2018 19:24	NG
Lead	BRL	0.00100		mg/L	260913	1	05/19/2018 02:33	NG
Zinc	3.52	0.0100		mg/L	260913	1	05/19/2018 02:33	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370490	1	05/15/2018 11:16	MP
Sulfate	290	10		mg/L	R370490	10	05/15/2018 13:17	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.0315	0.00500		mg/L	260890	1	05/19/2018 07:09	NG
Copper	0.0498	0.00200		mg/L	260890	1	05/19/2018 07:09	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 07:09	NG
Zinc	3.42	0.0100		mg/L	260890	1	05/19/2018 07:09	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260636	1	05/16/2018 00:05	SH
4,4´-DDE	BRL	0.00010		mg/L	260636	1	05/16/2018 00:05	SH
4,4´-DDT	BRL	0.00010		mg/L	260636	1	05/16/2018 00:05	SH
alpha-BHC	0.00081	0.000050		mg/L	260636	1	05/16/2018 20:54	UH
alpha-Chlordane	BRL	0.000050		mg/L	260636	1	05/16/2018 00:05	SH
beta-BHC	0.00035	0.000050		mg/L	260636	1	05/16/2018 20:54	UH
delta-BHC	0.015	0.0010		mg/L	260636	20	05/17/2018 11:05	UH
Dieldrin	BRL	0.00010		mg/L	260636	1	05/16/2018 00:05	SH
gamma-BHC	0.00060	0.000050		mg/L	260636	1	05/16/2018 20:54	UH
gamma-Chlordane	BRL	0.000050		mg/L	260636	1	05/16/2018 00:05	SH
Heptachlor	BRL	0.000050		mg/L	260636	1	05/16/2018 00:05	SH
Methoxychlor	BRL	0.00050		mg/L	260636	1	05/16/2018 00:05	SH
Toxaphene	BRL	0.0030		mg/L	260636	1	05/16/2018 00:05	SH
Surr: Decachlorobiphenyl	64.6	15.4-120		%REC	260636	1	05/16/2018 00:05	SH
Surr: Tetrachloro-m-xylene	80.7	37-126		%REC	260636	1	05/16/2018 00:05	SH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: DUP-2				**Lab ID:** 1805E48-002			
Collection Date: 5/14/2018 12:00:00 PM				**Matrix:** Groundwater			
ION SCAN SW9056A							
Nitrate	2.6		0.055	0.25	mg/L	R370499	1
Sulfate	1100		2.3	20	mg/L	R370499	20
Client Sample ID: MW-116				**Lab ID:** 1805E48-003			
Collection Date: 5/14/2018 11:51:00 AM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	2.19		0.372	0.400	mg/L	260913	200
Zinc	4.59		0.00168	0.0100	mg/L	260913	1
ION SCAN SW9056A							
Nitrate	16		0.55	2.5	mg/L	R370499	10
Sulfate	510		1.2	10	mg/L	R370499	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.72		0.00186	0.00200	mg/L	260890	1
Zinc	4.87		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
beta-BHC	0.00020		0.000004	0.000050	mg/L	260636	1
Client Sample ID: MW-113				**Lab ID:** 1805E48-004			
Collection Date: 5/14/2018 12:10:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
cis-1,2-Dichloroethene	0.046		0.00028	0.0050	mg/L	260937	1
Trichloroethene	0.026		0.00030	0.0050	mg/L	260937	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.00555		0.00205	0.00500	mg/L	260913	1
Copper	10.4		0.930	1.00	mg/L	260913	500
Lead	0.00519		0.000621	0.00100	mg/L	260913	1
Zinc	57.5		0.0336	0.200	mg/L	260913	20
ION SCAN SW9056A							
Nitrate	2.6		0.055	0.25	mg/L	R370499	1
Sulfate	1000		2.3	20	mg/L	R370499	20
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.00585		0.00205	0.00500	mg/L	260890	1
Copper	9.08		0.186	0.200	mg/L	260890	100
Lead	0.00506		0.000621	0.00100	mg/L	260890	1
Zinc	70.0		0.168	1.00	mg/L	260890	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00010		0.000010	0.000050	mg/L	260636	1
beta-BHC	0.00039		0.000004	0.000050	mg/L	260636	1
delta-BHC	0.000096		0.000009	0.000050	mg/L	260636	1
gamma-BHC	0.00015		0.000005	0.000050	mg/L	260636	1
Client Sample ID: MW-114				**Lab ID:** 1805E48-005			
Collection Date: 5/14/2018 4:10:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.93		0.186	0.200	mg/L	260913	100
Lead	0.00197		0.000621	0.00100	mg/L	260913	1

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-114				**Lab ID:** 1805E48-005			
Collection Date: 5/14/2018 4:10:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	8.47		0.0168	0.100	mg/L	260913	10
ION SCAN SW9056A							
Nitrate	25		0.55	2.5	mg/L	R370490	10
Sulfate	510		1.2	10	mg/L	R370490	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.36		0.00186	0.00200	mg/L	260890	1
Lead	0.00138		0.000621	0.00100	mg/L	260890	1
Zinc	9.36		0.0840	0.500	mg/L	260890	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00019		0.000010	0.000050	mg/L	260636	1
beta-BHC	0.0013		0.000004	0.000050	mg/L	260636	1
delta-BHC	0.000082		0.000009	0.000050	mg/L	260636	1
gamma-BHC	0.000086		0.000005	0.000050	mg/L	260636	1
Client Sample ID: OW-1				**Lab ID:** 1805E48-006			
Collection Date: 5/14/2018 4:01:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Chlorobenzene	0.041		0.00042	0.0050	mg/L	260937	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.126		0.00205	0.00500	mg/L	260913	1
Zinc	3.52		0.00168	0.0100	mg/L	260913	1
ION SCAN SW9056A							
Sulfate	290		1.2	10	mg/L	R370490	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0315		0.00205	0.00500	mg/L	260890	1
Copper	0.0498		0.00186	0.00200	mg/L	260890	1
Zinc	3.42		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00081		0.000010	0.000050	mg/L	260636	1
beta-BHC	0.00035		0.000004	0.000050	mg/L	260636	1
delta-BHC	0.015		0.00018	0.0010	mg/L	260636	20
gamma-BHC	0.00060		0.000005	0.000050	mg/L	260636	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear | Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Locked

Analytical Environmental Services, Inc

Date: 26-Jun-18

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Lab Order: 1805E48

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805E48-001A	TRIP BLANK	5/14/2018 12:00:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/17/2018
1805E48-002A	DUP-2	5/14/2018 12:00:00PM	Groundwater	ION SCAN			05/15/2018
1805E48-003A	MW-116	5/14/2018 11:51:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/22/2018
1805E48-003B	MW-116	5/14/2018 11:51:00AM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/19/2018
1805E48-003B	MW-116	5/14/2018 11:51:00AM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/25/2018
1805E48-003C	MW-116	5/14/2018 11:51:00AM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805E48-003D	MW-116	5/14/2018 11:51:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805E48-003E	MW-116	5/14/2018 11:51:00AM	Groundwater	ION SCAN			05/15/2018
1805E48-004A	MW-113	5/14/2018 12:10:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/22/2018
1805E48-004B	MW-113	5/14/2018 12:10:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/19/2018
1805E48-004B	MW-113	5/14/2018 12:10:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/25/2018
1805E48-004C	MW-113	5/14/2018 12:10:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805E48-004C	MW-113	5/14/2018 12:10:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/24/2018
1805E48-004D	MW-113	5/14/2018 12:10:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805E48-004D	MW-113	5/14/2018 12:10:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805E48-004E	MW-113	5/14/2018 12:10:00PM	Groundwater	ION SCAN			05/15/2018
1805E48-005A	MW-114	5/14/2018 4:10:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/22/2018
1805E48-005B	MW-114	5/14/2018 4:10:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/19/2018
1805E48-005B	MW-114	5/14/2018 4:10:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/25/2018
1805E48-005C	MW-114	5/14/2018 4:10:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805E48-005C	MW-114	5/14/2018 4:10:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/24/2018
1805E48-005D	MW-114	5/14/2018 4:10:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/15/2018
1805E48-005D	MW-114	5/14/2018 4:10:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018
1805E48-005E	MW-114	5/14/2018 4:10:00PM	Groundwater	ION SCAN			05/15/2018
1805E48-006A	OW-1	5/14/2018 4:01:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/17/2018 3:08:00PM	05/22/2018
1805E48-006B	OW-1	5/14/2018 4:01:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/19/2018
1805E48-006B	OW-1	5/14/2018 4:01:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 2:55:00PM	05/25/2018
1805E48-006C	OW-1	5/14/2018 4:01:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805E48-006D	OW-1	5/14/2018 4:01:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/16/2018

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Lab Order: 1805E48

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805E48-006D	OW-1	5/14/2018 4:01:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/15/2018 10:00:00AM	05/17/2018
1805E48-006E	OW-1	5/14/2018 4:01:00PM	Groundwater	ION SCAN			05/15/2018

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260636

Sample ID: **MB-260636** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212739**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000406	0	0.0005		81.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000395	0	0.0005		79.0	37	126				

Sample ID: **LCS-260636** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212740**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000760	0.00010	0.0010		76.0	61.9	135				
Dieldrin	0.000833	0.00010	0.0010		83.3	70.3	126				
gamma-BHC	0.000928	0.000050	0.0010		92.8	70.9	129				
Heptachlor	0.000853	0.000050	0.0010		85.3	63.5	128				
Surr: Decachlorobiphenyl	0.000366	0	0.0005		73.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000409	0	0.0005		81.8	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260636

Sample ID: **1805C21-008DMS** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212748**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001031	0.00010	0.0010		103	43.2	136				
Dieldrin	0.000985	0.00010	0.0010		98.5	44	139				
gamma-BHC	0.001118	0.000050	0.0010		112	53.8	141				
Heptachlor	0.001087	0.000050	0.0010		109	34.3	144				
Surr: Decachlorobiphenyl	0.000476	0	0.0005		95.3	15.4	120				
Surr: Tetrachloro-m-xylene	0.000540	0	0.0005		108	37	126				

Sample ID: **1805C21-008DMSD** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370465**
SampleType: **MSD** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260636** Analysis Date: **05/15/2018** Seq No: **8212749**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000946	0.00010	0.0010		94.6	43.2	136	0.001031	8.53	21.1	
Dieldrin	0.000931	0.00010	0.0010		93.1	44	139	0.0009851	5.60	20	
gamma-BHC	0.001033	0.000050	0.0010		103	53.8	141	0.001118	7.94	20	
Heptachlor	0.000990	0.000050	0.0010		99.0	34.3	144	0.001087	9.36	24.4	
Surr: Decachlorobiphenyl	0.000419	0	0.0005		83.8	15.4	120	0.0004763	0	0	
Surr: Tetrachloro-m-xylene	0.000464	0	0.0005		92.8	37	126	0.0005395	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260890

Sample ID: **MB-260890**	Client ID:				Units: **mg/L**		Prep Date: **05/18/2018**		Run No: **370916**	
SampleType: **MBLK**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260890**		Analysis Date: **05/25/2018**		Seq No: **8238704**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260890**	Client ID:				Units: **mg/L**		Prep Date: **05/18/2018**		Run No: **370916**	
SampleType: **LCS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260890**		Analysis Date: **05/19/2018**		Seq No: **8225185**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1025	0.00500	0.1000		103	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09971	0.00100	0.1000		99.7	80	120				
Zinc	0.1111	0.0100	0.1000	0.001845	109	80	120				

Sample ID: **1805E48-003CMS**	Client ID: **MW-116**				Units: **mg/L**		Prep Date: **05/18/2018**		Run No: **370916**	
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260890**		Analysis Date: **05/19/2018**		Seq No: **8225187**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09295	0.00500	0.1000		93.0	75	125				
Lead	0.09102	0.00100	0.1000		91.0	75	125				
Zinc	4.565	0.0100	0.1000	4.870	-305	75	125				S

Sample ID: **1805E48-003CMS**	Client ID: **MW-116**				Units: **mg/L**		Prep Date: **05/18/2018**		Run No: **371273**	
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260890**		Analysis Date: **05/24/2018**		Seq No: **8236868**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	2.262	0.0400	0.1000	2.118	144	75	125				S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260890

Sample ID: **1805E48-003CMSD**	Client ID: **MW-116**	Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**	BatchID: **260890**	Analysis Date: **05/19/2018**	Seq No: **8225188**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.03584	0.00500	0.1000		35.8	75	125	0.09295	88.7	20	SR
Lead	0.03430	0.00100	0.1000		34.3	75	125	0.09102	90.5	20	SR
Zinc	4.609	0.0100	0.1000	4.870	-261	75	125	4.565	0.969	20	S

Sample ID: **1805E48-003CMSD**	Client ID: **MW-116**	Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **371273**
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**	BatchID: **260890**	Analysis Date: **05/24/2018**	Seq No: **8236869**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	2.353	0.0400	0.1000	2.118	235	75	125	2.262	3.95	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260913

Sample ID: **MB-260913** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370723**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS** **SW6020B** BatchID: **260913** Analysis Date: **05/18/2018** Seq No: **8220168**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Lead	BRL	0.00100									

Sample ID: **MB-260913** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370723**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS** **SW6020B** BatchID: **260913** Analysis Date: **05/25/2018** Seq No: **8238713**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Zinc	BRL	0.0100									

Sample ID: **LCS-260913** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370723**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS** **SW6020B** BatchID: **260913** Analysis Date: **05/18/2018** Seq No: **8220170**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1176	0.00500	0.1000		118	80	120				
Copper	0.1051	0.00200	0.1000		105	80	120				
Lead	0.1059	0.00100	0.1000		106	80	120				
Zinc	0.09650	0.0100	0.1000	0.008564	87.9	80	120				

Sample ID: **1805I46-003BMS** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370723**
SampleType: **MS** TestCode: **Total Metals by ICP/MS** **SW6020B** BatchID: **260913** Analysis Date: **05/18/2018** Seq No: **8220176**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1220	0.00500	0.1000		122	75	125				
Copper	0.08947	0.00200	0.1000	0.003168	86.3	75	125				
Lead	0.1064	0.00100	0.1000		106	75	125				
Zinc	0.08144	0.0100	0.1000	0.002169	79.3	75	125				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260913

Sample ID: **1805I46-003BMSD** Client ID:
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/17/2018** Run No: **370723**
BatchID: **260913** Analysis Date: **05/18/2018** Seq No: **8220178**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1281	0.00500	0.1000		128	75	125	0.1220	4.88	20	S
Copper	0.08298	0.00200	0.1000	0.003168	79.8	75	125	0.08947	7.53	20	
Lead	0.1084	0.00100	0.1000		108	75	125	0.1064	1.92	20	
Zinc	0.08012	0.0100	0.1000	0.002169	77.9	75	125	0.08144	1.64	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **MB-260937** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8217987**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									
Styrene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **MB-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370641**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/17/2018**	Seq No: **8217987**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	0.0050									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04504	0	0.0500		90.1	68	127				
Surr: Dibromofluoromethane	0.04746	0	0.0500		94.9	84.4	122				
Surr: Toluene-d8	0.04608	0	0.0500		92.2	80.1	116				

Sample ID: **MB-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370641**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/17/2018**	Seq No: **8218300**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Isobutyl Alcohol	BRL	0.20									
Tetrahydrofuran	BRL	0.010									
Surr: 4-Bromofluorobenzene	0.05378	0	0.0500		108	68	127				
Surr: Dibromofluoromethane	0.05496	0	0.0500		110	84.4	122				
Surr: Toluene-d8	0.04988	0	0.0500		99.8	80.1	116				

Sample ID: **LCS-260937**	Client ID:		Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370700**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **260937**	Analysis Date: **05/18/2018**	Seq No: **8219641**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04213	0.0050	0.0500		84.3	69	136				
Benzene	0.04467	0.0050	0.0500		89.3	73.7	126				
Chlorobenzene	0.05137	0.0050	0.0500	0.0007600	101	73.5	124				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **LCS-260937** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370700**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/18/2018** Seq No: **8219641**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	0.04858	0.0050	0.0500		97.2	76.8	125				
Trichloroethene	0.04865	0.0050	0.0500		97.3	70.9	124				
Surr: 4-Bromofluorobenzene	0.05057	0	0.0500		101	68	127				
Surr: Dibromofluoromethane	0.05740	0	0.0500		115	84.4	122				
Surr: Toluene-d8	0.04608	0	0.0500		92.2	80.1	116				

Sample ID: **1805D56-001AMS** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218029**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	435.0	50	500.0		87.0	65.7	143				
Benzene	425.2	50	500.0		85.0	66.1	137				
Chlorobenzene	466.1	50	500.0		93.2	70.9	132				
Toluene	469.8	50	500.0		94.0	63.8	141				
Trichloroethene	460.2	50	500.0		92.0	70.6	128				
Surr: 4-Bromofluorobenzene	514.6	0	500.0		103	68	127				
Surr: Dibromofluoromethane	541.6	0	500.0		108	84.4	122				
Surr: Toluene-d8	489.3	0	500.0		97.9	80.1	116				

Sample ID: **1805D56-001AMSD** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218030**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	379.5	50	500.0		75.9	65.7	143	435.0	13.6	17.7	
Benzene	417.9	50	500.0		83.6	66.1	137	425.2	1.73	20	
Chlorobenzene	467.5	50	500.0		93.5	70.9	132	466.1	0.300	20	
Toluene	476.1	50	500.0		95.2	63.8	141	469.8	1.33	20	
Trichloroethene	451.0	50	500.0		90.2	70.6	128	460.2	2.02	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: 260937

Sample ID: **1805D56-001AMSD** Client ID:
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B**
Units: **mg/L** Prep Date: **05/17/2018** Run No: **370641**
BatchID: **260937** Analysis Date: **05/17/2018** Seq No: **8218030**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: 4-Bromofluorobenzene	501.6	0	500.0		100	68	127	514.6	0	0	
Surr: Dibromofluoromethane	488.2	0	500.0		97.6	84.4	122	541.6	0	0	
Surr: Toluene-d8	495.5	0	500.0		99.1	80.1	116	489.3	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: R370490

Sample ID: **MB-R370490** Client ID: Units: **mg/L** Prep Date: Run No: **370490**
SampleType: **MBLK** TestCode: **ION SCAN SW9056A** BatchID: **R370490** Analysis Date: **05/15/2018** Seq No: **8213609**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370490** Client ID: Units: **mg/L** Prep Date: Run No: **370490**
SampleType: **LCS** TestCode: **ION SCAN SW9056A** BatchID: **R370490** Analysis Date: **05/15/2018** Seq No: **8213608**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.418	0.25	5.000		108	90	110				
Sulfate	24.83	1.0	25.00		99.3	90	110				

Sample ID: **1805F41-002BMS** Client ID: Units: **mg/L** Prep Date: Run No: **370490**
SampleType: **MS** TestCode: **ION SCAN SW9056A** BatchID: **R370490** Analysis Date: **05/15/2018** Seq No: **8213617**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	56.13	2.5	50.00	2.438	107	90	110				
Sulfate	280.0	10	250.0	32.69	98.9	90	110				

Sample ID: **1805F41-002BMSD** Client ID: Units: **mg/L** Prep Date: Run No: **370490**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370490** Analysis Date: **05/15/2018** Seq No: **8213618**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	56.37	2.5	50.00	2.438	108	90	110	56.13	0.416	20	
Sulfate	279.5	10	250.0	32.69	98.7	90	110	280.0	0.196	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: R370499

Sample ID: **MB-R370499**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370499**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370499**		Analysis Date: **05/15/2018**		Seq No: **8213876**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370499**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370499**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370499**		Analysis Date: **05/15/2018**		Seq No: **8213877**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.347	0.25	5.000		107	90	110				
Sulfate	26.00	1.0	25.00		104	90	110				

Sample ID: **1805E48-002AMS**	Client ID: **DUP-2**				Units: **mg/L**		Prep Date:		Run No: **370499**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370499**		Analysis Date: **05/15/2018**		Seq No: **8213886**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	120.8	5.0	100.0	2.510	118	90	110				S
Sulfate	1543	20	500.0	1127	83.1	90	110				S

Sample ID: **1805E48-004EMS**	Client ID: **MW-113**				Units: **mg/L**		Prep Date:		Run No: **370499**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370499**		Analysis Date: **05/15/2018**		Seq No: **8213888**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	118.6	5.0	100.0	2.478	116	90	110				S
Sulfate	1478	20	500.0	1047	86.0	90	110				S

Sample ID: **1805E48-002AMSD**	Client ID: **DUP-2**				Units: **mg/L**		Prep Date:		Run No: **370499**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370499**		Analysis Date: **05/15/2018**		Seq No: **8213887**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	121.3	5.0	100.0	2.510	119	90	110	120.8	0.396	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805E48

ANALYTICAL QC SUMMARY REPORT

BatchID: R370499

Sample ID: **1805E48-002AMSD** Client ID: **DUP-2** Units: **mg/L** Prep Date: Run No: **370499**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370499** Analysis Date: **05/15/2018** Seq No: **8213887**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	1545	20	500.0	1127	83.6	90	110	1543	0.172	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

May 29, 2018

Rhonda Quinn
AMEC Foster Wheeler

1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805H49

Analytical Environmental Services, Inc. received 7 samples on 5/16/2018 5:32:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar

Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805H049

Date: 5/15/18 Page 1 of 1

COMPANY: Wood E+IS

ADDRESS: 1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144

PHONE: 770-421-3400

EMAIL:

SAMPLED BY: D Howard, E Gaillen, B Rhiner

SIGNATURE: Daniel L Howard

ANALYSIS REQUESTED

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	GRAB	COMPOSITE	MATRIX (see codes)	PRESERVATION (see codes)	VOC List 8260	Total Mets 6020	Diss Mets 6020	Pest 8081A	Nitrate 9056 Sulfate	REMARKS	Number of Containers
							HI / N / I / I / I							
1	Trip Blank-07	5/16/18	1000	X		W	2							2
2	TW-6		1218	X		GW	2 1 1 2 1							7
3	TW-7		1508	X		GW	2 1 1 2 1							7
4	DUP-3		1200	X		GW	2							2
5	TW-8		1224	X		GW	2 1 1 2 1							7
6	TW-9		1624	X		GW	2 1 1 2 1							7
7	MW-120		1220	X		GW	2 1 1 2 1							7
8	Temp Blank													
9														
10														
11														
12														
13														
14														

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY: DATE/TIME:

1. Daniel L Howard 5/16/18 1703
2. [signature] 5/16/18 5:32
3.

RECEIVED BY: DATE/TIME:

1. [signature] 5/16/18 5:03
2.
3.

SPECIAL INSTRUCTIONS/COMMENTS:
Lab will Fiter dissolved metals
Metals: As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail (courier) Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: BFEL Atlanta
PROJECT #: 6122080154.28
SITE ADDRESS: 1525 Pine St Atlanta, GA
SEND REPORT TO: Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ● III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT.
Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TRIP BLANK-07
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 10:00:00 AM
Lab ID:	1805H49-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 10:16	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 10:16	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 10:16	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 10:16	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 10:16	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 10:16	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 10:16	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 10:16	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 10:16	NP
Surr: 4-Bromofluorobenzene	97.3	68-127		%REC	261335	1	05/23/2018 10:16	NP
Surr: Dibromofluoromethane	96.1	84.4-122		%REC	261335	1	05/23/2018 10:16	NP
Surr: Toluene-d8	101	80.1-116		%REC	261335	1	05/23/2018 10:16	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-6
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:18:00 PM
Lab ID:	1805H49-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 11:07	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 11:07	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 11:07	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 11:07	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 11:07	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 11:07	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 11:07	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 11:07	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 11:07	NP
Surr: 4-Bromofluorobenzene	96.5	68-127		%REC	261335	1	05/23/2018 11:07	NP
Surr: Dibromofluoromethane	97	84.4-122		%REC	261335	1	05/23/2018 11:07	NP
Surr: Toluene-d8	102	80.1-116		%REC	261335	1	05/23/2018 11:07	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-6
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:18:00 PM
Lab ID:	1805H49-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.00672	0.00500		mg/L	260895	1	05/19/2018 05:04	NG
Copper	1.06	0.0400		mg/L	260895	20	05/25/2018 10:30	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 05:04	NG
Zinc	36.0	0.200		mg/L	260895	20	05/25/2018 10:30	DP
ION SCAN SW9056A								
Nitrate	34	5.0		mg/L	R370660	20	05/17/2018 14:05	MP
Sulfate	790	20		mg/L	R370660	20	05/17/2018 14:05	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.00707	0.00500		mg/L	260890	1	05/19/2018 07:35	NG
Copper	0.669	0.00200		mg/L	260890	1	05/19/2018 07:35	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 07:35	NG
Zinc	37.6	0.200		mg/L	260890	20	05/25/2018 11:20	DP
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 15:13	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 15:13	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 15:13	UH
alpha-BHC	0.0018	0.00010		mg/L	260772	2	05/17/2018 19:17	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:13	UH
beta-BHC	0.0021	0.00010		mg/L	260772	2	05/17/2018 19:17	UH
delta-BHC	0.00047	0.000050		mg/L	260772	1	05/17/2018 15:13	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 15:13	UH
gamma-BHC	0.00067	0.000050		mg/L	260772	1	05/17/2018 15:13	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:13	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 15:13	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 15:13	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 15:13	UH
Surr: Decachlorobiphenyl	80.5	15.4-120		%REC	260772	1	05/17/2018 15:13	UH
Surr: Tetrachloro-m-xylene	76.1	37-126		%REC	260772	1	05/17/2018 15:13	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-7
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 3:08:00 PM
Lab ID:	1805H49-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 11:34	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 11:34	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 11:34	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 11:34	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 11:34	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 11:34	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 11:34	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 11:34	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 11:34	NP
Surr: 4-Bromofluorobenzene	95.6	68-127		%REC	261335	1	05/23/2018 11:34	NP
Surr: Dibromofluoromethane	96.1	84.4-122		%REC	261335	1	05/23/2018 11:34	NP
Surr: Toluene-d8	101	80.1-116		%REC	261335	1	05/23/2018 11:34	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-7
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 3:08:00 PM
Lab ID:	1805H49-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.0108	0.00500		mg/L	260895	1	05/19/2018 05:10	NG
Copper	124	0.200		mg/L	260895	100	05/25/2018 10:31	DP
Lead	0.0190	0.00100		mg/L	260895	1	05/19/2018 05:10	NG
Zinc	359	1.00		mg/L	260895	100	05/25/2018 10:31	DP
ION SCAN SW9056A								
Nitrate	110	25		mg/L	R370660	100	05/17/2018 14:20	MP
Sulfate	4400	100		mg/L	R370660	100	05/17/2018 14:20	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.0113	0.00500		mg/L	260890	1	05/19/2018 07:41	NG
Copper	128	0.200		mg/L	260890	100	05/25/2018 11:22	DP
Lead	0.0187	0.00100		mg/L	260890	1	05/19/2018 07:41	NG
Zinc	381	1.00		mg/L	260890	100	05/25/2018 11:22	DP
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 15:24	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 15:24	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 15:24	UH
alpha-BHC	0.00096	0.000050		mg/L	260772	1	05/17/2018 15:24	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:24	UH
beta-BHC	0.0027	0.00025		mg/L	260772	5	05/17/2018 19:28	UH
delta-BHC	0.00097	0.000050		mg/L	260772	1	05/17/2018 15:24	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 15:24	UH
gamma-BHC	0.00099	0.000050		mg/L	260772	1	05/17/2018 15:24	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:24	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 15:24	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 15:24	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 15:24	UH
Surr: Decachlorobiphenyl	97.6	15.4-120		%REC	260772	1	05/17/2018 15:24	UH
Surr: Tetrachloro-m-xylene	128	37-126	S	%REC	260772	1	05/17/2018 15:24	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	DUP-3
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:00:00 PM
Lab ID:	1805H49-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	0.0031	0.0010		mg/L	260772	10	05/18/2018 14:37	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 15:35	UH
4,4´-DDT	0.0057	0.0010		mg/L	260772	10	05/18/2018 14:37	UH
alpha-BHC	0.83	0.25		mg/L	260772	5000	05/18/2018 14:15	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:35	UH
beta-BHC	0.091	0.010		mg/L	260772	200	05/17/2018 19:39	UH
delta-BHC	2.7	0.25		mg/L	260772	5000	05/18/2018 14:15	UH
Dieldrin	0.0038	0.0010		mg/L	260772	10	05/18/2018 14:37	UH
gamma-BHC	2.3	0.25		mg/L	260772	5000	05/18/2018 14:15	UH
gamma-Chlordane	0.00072	0.00050		mg/L	260772	10	05/18/2018 14:37	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 15:35	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 15:35	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 15:35	UH
Surr: Decachlorobiphenyl	109	15.4-120		%REC	260772	1	05/17/2018 15:35	UH
Surr: Tetrachloro-m-xylene	0	37-126	S	%REC	260772	1	05/17/2018 15:35	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-8
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:24:00 PM
Lab ID:	1805H49-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,2,4-Trichlorobenzene	0.090	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 12:53	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 12:53	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 12:53	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 12:53	NP
Benzene	0.17	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Chlorobenzene	1.1	0.050		mg/L	261335	10	05/23/2018 13:49	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 12:53	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 12:53	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 12:53	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 12:53	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 12:53	NP
Surr: 4-Bromofluorobenzene	93.5	68-127		%REC	261335	1	05/23/2018 12:53	NP
Surr: 4-Bromofluorobenzene	95.6	68-127		%REC	261335	10	05/23/2018 13:49	NP
Surr: Dibromofluoromethane	95	84.4-122		%REC	261335	1	05/23/2018 12:53	NP
Surr: Dibromofluoromethane	94	84.4-122		%REC	261335	10	05/23/2018 13:49	NP
Surr: Toluene-d8	101	80.1-116		%REC	261335	1	05/23/2018 12:53	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-8
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:24:00 PM
Lab ID:	1805H49-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
Surr: Toluene-d8	101	80.1-116		%REC	261335	10	05/23/2018 13:49	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.0988	0.00500		mg/L	260895	1	05/19/2018 05:16	NG
Copper	0.0664	0.0400		mg/L	260895	20	05/25/2018 10:33	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 05:16	NG
Zinc	1.14	0.200		mg/L	260895	20	05/25/2018 10:33	DP
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370660	1	05/17/2018 13:27	MP
Sulfate	850	20		mg/L	R370660	20	05/17/2018 14:35	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.0248	0.00500		mg/L	260890	1	05/19/2018 07:47	NG
Copper	0.0203	0.00200		mg/L	260890	1	05/19/2018 07:47	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 07:47	NG
Zinc	0.544	0.0100		mg/L	260890	1	05/19/2018 07:47	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	0.0036	0.0010		mg/L	260772	10	05/18/2018 14:48	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 15:46	UH
4,4´-DDT	0.013	0.0010		mg/L	260772	10	05/18/2018 14:48	UH
alpha-BHC	0.74	0.025		mg/L	260772	500	05/17/2018 20:01	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:46	UH
beta-BHC	0.078	0.025		mg/L	260772	500	05/17/2018 20:01	UH
delta-BHC	2.0	0.12		mg/L	260772	2500	05/18/2018 14:26	UH
Dieldrin	0.0040	0.0010		mg/L	260772	10	05/18/2018 14:48	UH
gamma-BHC	1.7	0.12		mg/L	260772	2500	05/18/2018 14:26	UH
gamma-Chlordane	0.00079	0.00050		mg/L	260772	10	05/18/2018 14:48	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 15:46	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 15:46	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 15:46	UH
Surr: Decachlorobiphenyl	94.3	15.4-120		%REC	260772	1	05/17/2018 15:46	UH
Surr: Tetrachloro-m-xylene	0	37-126	S	%REC	260772	1	05/17/2018 15:46	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-9
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 4:24:00 PM
Lab ID:	1805H49-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 11:59	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 11:59	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 11:59	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 11:59	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 11:59	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 11:59	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 11:59	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 11:59	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 11:59	NP
Surr: 4-Bromofluorobenzene	94.9	68-127		%REC	261335	1	05/23/2018 11:59	NP
Surr: Dibromofluoromethane	95.4	84.4-122		%REC	261335	1	05/23/2018 11:59	NP
Surr: Toluene-d8	99.8	80.1-116		%REC	261335	1	05/23/2018 11:59	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-9
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 4:24:00 PM
Lab ID:	1805H49-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 05:42	NG
Copper	0.0534	0.0400		mg/L	260895	20	05/25/2018 10:35	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 05:42	NG
Zinc	2.28	0.200		mg/L	260895	20	05/25/2018 10:35	DP
ION SCAN SW9056A								
Nitrate	0.27	0.25		mg/L	R370650	1	05/17/2018 10:48	MP
Sulfate	160	10		mg/L	R370650	10	05/17/2018 11:33	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 07:53	NG
Copper	0.0402	0.00200		mg/L	260890	1	05/19/2018 07:53	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 07:53	NG
Zinc	1.92	0.0100		mg/L	260890	1	05/19/2018 07:53	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 15:58	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 15:58	UH
4,4´-DDT	0.00020	0.00010		mg/L	260772	1	05/17/2018 15:58	UH
alpha-BHC	0.0048	0.00050		mg/L	260772	10	05/17/2018 20:13	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:58	UH
beta-BHC	0.0090	0.00050		mg/L	260772	10	05/17/2018 20:13	UH
delta-BHC	0.0035	0.00050		mg/L	260772	10	05/17/2018 20:13	UH
Dieldrin	0.00019	0.00010		mg/L	260772	1	05/17/2018 15:58	UH
gamma-BHC	0.0015	0.000050		mg/L	260772	1	05/17/2018 15:58	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 15:58	UH
Heptachlor	0.00017	0.000050		mg/L	260772	1	05/17/2018 15:58	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 15:58	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 15:58	UH
Surr: Decachlorobiphenyl	96.4	15.4-120		%REC	260772	1	05/17/2018 15:58	UH
Surr: Tetrachloro-m-xylene	111	37-126		%REC	260772	1	05/17/2018 15:58	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-120
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:20:00 PM
Lab ID:	1805H49-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 12:27	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 12:27	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 12:27	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 12:27	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 12:27	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
cis-1,2-Dichloroethene	0.014	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 12:27	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 12:27	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Trichloroethene	0.0068	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 12:27	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 12:27	NP
Surr: 4-Bromofluorobenzene	95.9	68-127		%REC	261335	1	05/23/2018 12:27	NP
Surr: Dibromofluoromethane	95.1	84.4-122		%REC	261335	1	05/23/2018 12:27	NP
Surr: Toluene-d8	101	80.1-116		%REC	261335	1	05/23/2018 12:27	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-120
Project Name:	BFEL Atlanta	**Collection Date:**	5/16/2018 12:20:00 PM
Lab ID:	1805H49-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 05:48	NG
Copper	0.00857	0.00200		mg/L	260895	1	05/25/2018 10:37	DP
Lead	0.00101	0.00100		mg/L	260895	1	05/19/2018 05:48	NG
Zinc	0.637	0.0100		mg/L	260895	1	05/25/2018 10:37	DP
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370650	1	05/17/2018 11:03	MP
Sulfate	220	10		mg/L	R370650	10	05/17/2018 11:48	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 08:00	NG
Copper	0.00629	0.00200		mg/L	260890	1	05/19/2018 08:00	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 08:00	NG
Zinc	0.614	0.0100		mg/L	260890	1	05/19/2018 08:00	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 16:09	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 16:09	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 16:09	UH
alpha-BHC	0.0013	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
beta-BHC	0.0015	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
delta-BHC	0.0012	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 16:09	UH
gamma-BHC	0.00016	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 16:09	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 16:09	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 16:09	UH
Surr: Decachlorobiphenyl	48.6	15.4-120		%REC	260772	1	05/17/2018 16:09	UH
Surr: Tetrachloro-m-xylene	81.2	37-126		%REC	260772	1	05/17/2018 16:09	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 29-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: TW-6				**Lab ID:** 1805H49-002			
Collection Date: 5/16/2018 12:18:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.00672		0.00205	0.00500	mg/L	260895	1
Copper	1.06		0.0372	0.0400	mg/L	260895	20
Zinc	36.0		0.0336	0.200	mg/L	260895	20
ION SCAN SW9056A							
Nitrate	34		1.1	5.0	mg/L	R370660	20
Sulfate	790		2.3	20	mg/L	R370660	20
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.00707		0.00205	0.00500	mg/L	260890	1
Copper	0.669		0.00186	0.00200	mg/L	260890	1
Zinc	37.6		0.0336	0.200	mg/L	260890	20
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.0018		0.000036	0.00010	mg/L	260772	2
beta-BHC	0.0021		0.000031	0.00010	mg/L	260772	2
delta-BHC	0.00047		0.000014	0.000050	mg/L	260772	1
gamma-BHC	0.00067		0.000017	0.000050	mg/L	260772	1
Client Sample ID: TW-7				**Lab ID:** 1805H49-003			
Collection Date: 5/16/2018 3:08:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0108		0.00205	0.00500	mg/L	260895	1
Copper	124		0.186	0.200	mg/L	260895	100
Lead	0.0190		0.000621	0.00100	mg/L	260895	1
Zinc	359		0.168	1.00	mg/L	260895	100
ION SCAN SW9056A							
Nitrate	110		5.5	25	mg/L	R370660	100
Sulfate	4400		12	100	mg/L	R370660	100
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0113		0.00205	0.00500	mg/L	260890	1
Copper	128		0.186	0.200	mg/L	260890	100
Lead	0.0187		0.000621	0.00100	mg/L	260890	1
Zinc	381		0.168	1.00	mg/L	260890	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00096		0.000018	0.000050	mg/L	260772	1
beta-BHC	0.0027		0.000077	0.00025	mg/L	260772	5
delta-BHC	0.00097		0.000014	0.000050	mg/L	260772	1
gamma-BHC	0.00099		0.000017	0.000050	mg/L	260772	1
Client Sample ID: DUP-3				**Lab ID:** 1805H49-004			
Collection Date: 5/16/2018 12:00:00 PM				**Matrix:** Groundwater			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
4,4´-DDD	0.0031		0.00016	0.0010	mg/L	260772	10
4,4´-DDT	0.0057		0.00026	0.0010	mg/L	260772	10
alpha-BHC	0.83		0.090	0.25	mg/L	260772	5000
beta-BHC	0.091		0.0031	0.010	mg/L	260772	200
delta-BHC	2.7		0.068	0.25	mg/L	260772	5000
Dieldrin	0.0038		0.00017	0.0010	mg/L	260772	10

Analytical Environmental Services, Inc

Date: 29-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: DUP-3				**Lab ID:** 1805H49-004			
Collection Date: 5/16/2018 12:00:00 PM				**Matrix:** Groundwater			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
gamma-BHC	2.3		0.086	0.25	mg/L	260772	5000
gamma-Chlordane	0.00072		0.00062	0.00050	mg/L	260772	10
Client Sample ID: TW-8				**Lab ID:** 1805H49-005			
Collection Date: 5/16/2018 12:24:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
1,2,4-Trichlorobenzene	0.090		0.00039	0.0050	mg/L	261335	1
Benzene	0.17		0.00037	0.0050	mg/L	261335	1
Chlorobenzene	1.1		0.0042	0.050	mg/L	261335	10
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0988		0.00205	0.00500	mg/L	260895	1
Copper	0.0664		0.0372	0.0400	mg/L	260895	20
Zinc	1.14		0.0336	0.200	mg/L	260895	20
ION SCAN SW9056A							
Sulfate	850		2.3	20	mg/L	R370660	20
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0248		0.00205	0.00500	mg/L	260890	1
Copper	0.0203		0.00186	0.00200	mg/L	260890	1
Zinc	0.544		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
4,4´-DDD	0.0036		0.00016	0.0010	mg/L	260772	10
4,4´-DDT	0.013		0.00026	0.0010	mg/L	260772	10
alpha-BHC	0.74		0.0090	0.025	mg/L	260772	500
beta-BHC	0.078		0.0077	0.025	mg/L	260772	500
delta-BHC	2.0		0.034	0.12	mg/L	260772	2500
Dieldrin	0.0040		0.00017	0.0010	mg/L	260772	10
gamma-BHC	1.7		0.043	0.12	mg/L	260772	2500
gamma-Chlordane	0.00079		0.00062	0.00050	mg/L	260772	10
Client Sample ID: TW-9				**Lab ID:** 1805H49-006			
Collection Date: 5/16/2018 4:24:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0534		0.0372	0.0400	mg/L	260895	20
Zinc	2.28		0.0336	0.200	mg/L	260895	20
ION SCAN SW9056A							
Nitrate	0.27		0.055	0.25	mg/L	R370650	1
Sulfate	160		1.2	10	mg/L	R370650	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0402		0.00186	0.00200	mg/L	260890	1
Zinc	1.92		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
4,4´-DDT	0.00020		0.000026	0.00010	mg/L	260772	1
alpha-BHC	0.0048		0.00018	0.00050	mg/L	260772	10
beta-BHC	0.0090		0.00015	0.00050	mg/L	260772	10
delta-BHC	0.0035		0.00014	0.00050	mg/L	260772	10

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: TW-9				**Lab ID:** 1805H49-006			
Collection Date: 5/16/2018 4:24:00 PM				**Matrix:** Groundwater			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
Dieldrin	0.00019		0.000017	0.00010	mg/L	260772	1
gamma-BHC	0.0015		0.000017	0.000050	mg/L	260772	1
Heptachlor	0.00017		0.000026	0.000050	mg/L	260772	1
Client Sample ID: MW-120				**Lab ID:** 1805H49-007			
Collection Date: 5/16/2018 12:20:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
cis-1,2-Dichloroethene	0.014		0.00028	0.0050	mg/L	261335	1
Trichloroethene	0.0068		0.00030	0.0050	mg/L	261335	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00857		0.00186	0.00200	mg/L	260895	1
Lead	0.00101		0.000621	0.00100	mg/L	260895	1
Zinc	0.637		0.00168	0.0100	mg/L	260895	1
ION SCAN SW9056A							
Sulfate	220		1.2	10	mg/L	R370650	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00629		0.00186	0.00200	mg/L	260890	1
Zinc	0.614		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.0013		0.000018	0.000050	mg/L	260772	1
beta-BHC	0.0015		0.000015	0.000050	mg/L	260772	1
delta-BHC	0.0012		0.000014	0.000050	mg/L	260772	1
gamma-BHC	0.00016		0.000017	0.000050	mg/L	260772	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear | Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Analytical Environmental Services, Inc

Date: 29-May-18

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805H49

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805H49-001A	TRIP BLANK-07	5/16/2018 10:00:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H49-002A	TW-6	5/16/2018 12:18:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H49-002B	TW-6	5/16/2018 12:18:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805H49-002B	TW-6	5/16/2018 12:18:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/25/2018
1805H49-002C	TW-6	5/16/2018 12:18:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805H49-002C	TW-6	5/16/2018 12:18:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/25/2018
1805H49-002D	TW-6	5/16/2018 12:18:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/17/2018
1805H49-002E	TW-6	5/16/2018 12:18:00PM	Groundwater	ION SCAN			05/17/2018
1805H49-003A	TW-7	5/16/2018 3:08:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H49-003B	TW-7	5/16/2018 3:08:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805H49-003B	TW-7	5/16/2018 3:08:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/25/2018
1805H49-003C	TW-7	5/16/2018 3:08:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805H49-003C	TW-7	5/16/2018 3:08:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/25/2018
1805H49-003D	TW-7	5/16/2018 3:08:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/17/2018
1805H49-003E	TW-7	5/16/2018 3:08:00PM	Groundwater	ION SCAN			05/17/2018
1805H49-004A	DUP-3	5/16/2018 12:00:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/17/2018
1805H49-004A	DUP-3	5/16/2018 12:00:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/18/2018
1805H49-005A	TW-8	5/16/2018 12:24:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H49-005B	TW-8	5/16/2018 12:24:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805H49-005B	TW-8	5/16/2018 12:24:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/25/2018
1805H49-005C	TW-8	5/16/2018 12:24:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805H49-005D	TW-8	5/16/2018 12:24:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/17/2018
1805H49-005D	TW-8	5/16/2018 12:24:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/18/2018
1805H49-005E	TW-8	5/16/2018 12:24:00PM	Groundwater	ION SCAN			05/17/2018
1805H49-006A	TW-9	5/16/2018 4:24:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H49-006B	TW-9	5/16/2018 4:24:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805H49-006B	TW-9	5/16/2018 4:24:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/25/2018
1805H49-006C	TW-9	5/16/2018 4:24:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805H49-006D	TW-9	5/16/2018 4:24:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/17/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805H49

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805H49-006E	TW-9	5/16/2018 4:24:00PM	Groundwater	ION SCAN			05/17/2018
1805H49-007A	MW-120	5/16/2018 12:20:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H49-007B	MW-120	5/16/2018 12:20:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805H49-007B	MW-120	5/16/2018 12:20:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/25/2018
1805H49-007C	MW-120	5/16/2018 12:20:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805H49-007D	MW-120	5/16/2018 12:20:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/17/2018 8:30:00AM	05/17/2018
1805H49-007E	MW-120	5/16/2018 12:20:00PM	Groundwater	ION SCAN			05/17/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 260772

Sample ID: **MB-260772** Client ID: Units: **mg/L** Prep Date: **05/16/2018** Run No: **370726**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260772** Analysis Date: **05/17/2018** Seq No: **8220334**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000294	0	0.0005		58.7	15.4	120				
Surr: Tetrachloro-m-xylene	0.000439	0	0.0005		87.7	37	126				

Sample ID: **LCS-260772** Client ID: Units: **mg/L** Prep Date: **05/16/2018** Run No: **370726**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260772** Analysis Date: **05/17/2018** Seq No: **8220335**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001031	0.00010	0.0010		103	61.9	135				
Dieldrin	0.000977	0.00010	0.0010		97.7	70.3	126				
gamma-BHC	0.000976	0.000050	0.0010		97.6	70.9	129				
Heptachlor	0.000960	0.000050	0.0010		96.0	63.5	128				
Surr: Decachlorobiphenyl	0.000325	0	0.0005		65.0	15.4	120				
Surr: Tetrachloro-m-xylene	0.000457	0	0.0005		91.4	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 260772

Sample ID: **1805954-002BMS**	Client ID:			Units: **mg/L**		Prep Date: **05/16/2018**		Run No: **370726**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**			BatchID: **260772**		Analysis Date: **05/17/2018**		Seq No: **8220337**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000971	0.00010	0.0010		97.1	43.2	136				
Dieldrin	0.000941	0.00010	0.0010		94.1	44	139				
Heptachlor	0.000959	0.000050	0.0010		95.9	34.3	144				
Surr: Decachlorobiphenyl	0.000416	0	0.0005		83.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000424	0	0.0005		84.9	37	126				

Sample ID: **1805954-002BMS**	Client ID:			Units: **mg/L**		Prep Date: **05/16/2018**		Run No: **370726**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**			BatchID: **260772**		Analysis Date: **05/17/2018**		Seq No: **8220359**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
gamma-BHC	0.001821	0.00010	0.0010	0.0007176	110	53.8	141				

Sample ID: **1805954-002BMSD**	Client ID:			Units: **mg/L**		Prep Date: **05/16/2018**		Run No: **370726**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**			BatchID: **260772**		Analysis Date: **05/17/2018**		Seq No: **8220338**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000903	0.00010	0.0010		90.3	43.2	136	0.0009714	7.27	21.1	
Dieldrin	0.000872	0.00010	0.0010		87.2	44	139	0.0009411	7.62	20	
gamma-BHC	0.001534	0.000050	0.0010	0.0006701	86.4	53.8	141	0.001645	6.98	20	
Heptachlor	0.000906	0.000050	0.0010		90.6	34.3	144	0.0009589	5.71	24.4	
Surr: Decachlorobiphenyl	0.000401	0	0.0005		80.2	15.4	120	0.0004156	0	0	
Surr: Tetrachloro-m-xylene	0.000393	0	0.0005		78.7	37	126	0.0004243	0	0	

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 260890

Sample ID: **MB-260890**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **MBLK**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/25/2018**	Seq No: **8238704**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260890**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **LCS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/19/2018**	Seq No: **8225185**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1025	0.00500	0.1000		103	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09971	0.00100	0.1000		99.7	80	120				
Zinc	0.1111	0.0100	0.1000	0.001845	109	80	120				

Sample ID: **1805E48-003CMS**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/19/2018**	Seq No: **8225187**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09295	0.00500	0.1000		93.0	75	125				
Lead	0.09102	0.00100	0.1000		91.0	75	125				
Zinc	4.565	0.0100	0.1000	4.870	-305	75	125				S

Sample ID: **1805E48-003CMS**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **371273**
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/24/2018**	Seq No: **8236868**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	2.262	0.0400	0.1000	2.118	144	75	125				S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 260890

Sample ID: **1805E48-003CMSD** Client ID:
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/18/2018** Run No: **370916**
BatchID: **260890** Analysis Date: **05/19/2018** Seq No: **8225188**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.03584	0.00500	0.1000		35.8	75	125	0.09295	88.7	20	SR
Lead	0.03430	0.00100	0.1000		34.3	75	125	0.09102	90.5	20	SR
Zinc	4.609	0.0100	0.1000	4.870	-261	75	125	4.565	0.969	20	S

Sample ID: **1805E48-003CMSD** Client ID:
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/18/2018** Run No: **371273**
BatchID: **260890** Analysis Date: **05/24/2018** Seq No: **8236869**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	2.353	0.0400	0.1000	2.118	235	75	125	2.262	3.95	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 260895

Sample ID: **MB-260895** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370915**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260895** Analysis Date: **05/22/2018** Seq No: **8236013**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260895** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370915**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260895** Analysis Date: **05/19/2018** Seq No: **8225140**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09387	0.00500	0.1000		93.9	80	120				
Copper	0.09371	0.00200	0.1000		93.7	80	120				
Lead	0.09699	0.00100	0.1000		97.0	80	120				
Zinc	0.09411	0.0100	0.1000	0.002870	91.2	80	120				

Sample ID: **1805954-002DMS** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370915**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260895** Analysis Date: **05/19/2018** Seq No: **8225142**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09524	0.00500	0.1000		95.2	75	125				
Copper	0.7569	0.00200	0.1000	0.6519	105	75	125				
Lead	0.1016	0.00100	0.1000	0.002450	99.2	75	125				
Zinc	1.897	0.0100	0.1000	1.757	140	75	125				S

Sample ID: **1805954-002DMSD** Client ID: Units: **mg/L** Prep Date: **05/17/2018** Run No: **370915**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260895** Analysis Date: **05/19/2018** Seq No: **8225143**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09429	0.00500	0.1000		94.3	75	125	0.09524	1.01	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 260895

Sample ID: **1805954-002DMSD** Client ID:
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B**
Units: **mg/L** Prep Date: **05/17/2018** Run No: **370915**
BatchID: **260895** Analysis Date: **05/19/2018** Seq No: **8225143**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.7659	0.00200	0.1000	0.6519	114	75	125	0.7569	1.18	20	
Lead	0.1013	0.00100	0.1000	0.002450	98.8	75	125	0.1016	0.382	20	
Zinc	1.909	0.0100	0.1000	1.757	152	75	125	1.897	0.628	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **MB-261335**	Client ID:				Units: **mg/L**		Prep Date: **05/23/2018**		Run No: **371148**		
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**				BatchID: **261335**		Analysis Date: **05/23/2018**		Seq No: **8231842**		
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									
Styrene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **MB-261335**	Client ID:		Units: **mg/L**	Prep Date: **05/23/2018**	Run No: **371148**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261335**	Analysis Date: **05/23/2018**	Seq No: **8231842**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	0.0050									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04844	0	0.0500		96.9	68	127				
Surr: Dibromofluoromethane	0.04824	0	0.0500		96.5	84.4	122				
Surr: Toluene-d8	0.05090	0	0.0500		102	80.1	116				

Sample ID: **MB-261335**	Client ID:		Units: **mg/L**	Prep Date: **05/23/2018**	Run No: **371148**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261335**	Analysis Date: **05/23/2018**	Seq No: **8231972**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Isobutyl Alcohol	BRL	0.20									
Tetrahydrofuran	BRL	0.010									
Surr: 4-Bromofluorobenzene	0.04828	0	0.0500		96.6	68	127				
Surr: Dibromofluoromethane	0.04965	0	0.0500		99.3	84.4	122				
Surr: Toluene-d8	0.05147	0	0.0500		103	80.1	116				

Sample ID: **LCS-261335**	Client ID:		Units: **mg/L**	Prep Date: **05/23/2018**	Run No: **371163**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261335**	Analysis Date: **05/24/2018**	Seq No: **8232846**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.05425	0.0050	0.0500		108	69	136				
Benzene	0.05042	0.0050	0.0500		101	73.7	126				
Chlorobenzene	0.05078	0.0050	0.0500		102	73.5	124				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **LCS-261335** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371163**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/24/2018** Seq No: **8232846**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	0.04719	0.0050	0.0500		94.4	76.8	125				
Trichloroethene	0.04951	0.0050	0.0500		99.0	70.9	124				
Surr: 4-Bromofluorobenzene	0.04697	0	0.0500		93.9	68	127				
Surr: Dibromofluoromethane	0.04542	0	0.0500		90.8	84.4	122				
Surr: Toluene-d8	0.05132	0	0.0500		103	80.1	116				

Sample ID: **1805H68-002AMS** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371148**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/23/2018** Seq No: **8231860**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04590	0.0050	0.0500		91.8	65.7	143				
Benzene	0.04645	0.0050	0.0500		92.9	66.1	137				
Chlorobenzene	0.04820	0.0050	0.0500		96.4	70.9	132				
Toluene	0.04446	0.0050	0.0500		88.9	63.8	141				
Trichloroethene	0.04597	0.0050	0.0500		91.9	70.6	128				
Surr: 4-Bromofluorobenzene	0.04809	0	0.0500		96.2	68	127				
Surr: Dibromofluoromethane	0.04721	0	0.0500		94.4	84.4	122				
Surr: Toluene-d8	0.05131	0	0.0500		103	80.1	116				

Sample ID: **1805H68-002AMSD** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371148**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/23/2018** Seq No: **8231861**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04106	0.0050	0.0500		82.1	65.7	143	0.04590	11.1	17.7	
Benzene	0.04754	0.0050	0.0500		95.1	66.1	137	0.04645	2.32	20	
Chlorobenzene	0.05024	0.0050	0.0500		100	70.9	132	0.04820	4.14	20	
Toluene	0.04507	0.0050	0.0500		90.1	63.8	141	0.04446	1.36	20	
Trichloroethene	0.04587	0.0050	0.0500		91.7	70.6	128	0.04597	0.218	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **1805H68-002AMSD** Client ID:
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B**
Units: **mg/L** Prep Date: **05/23/2018** Run No: **371148**
BatchID: **261335** Analysis Date: **05/23/2018** Seq No: **8231861**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: 4-Bromofluorobenzene	0.04856	0	0.0500		97.1	68	127	0.04809	0	0	
Surr: Dibromofluoromethane	0.04801	0	0.0500		96.0	84.4	122	0.04721	0	0	
Surr: Toluene-d8	0.05171	0	0.0500		103	80.1	116	0.05131	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: R370650

Sample ID: **MB-R370650**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218283**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370650**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218282**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.436	0.25	5.000		109	90	110				
Sulfate	24.63	1.0	25.00		98.5	90	110				

Sample ID: **1805I16-001AMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218294**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.441	0.25	5.000	0.1019	107	90	110				
Sulfate	25.40	1.0	25.00	0.3249	100	90	110				

Sample ID: **1805I18-001AMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218296**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.958	0.25	5.000	0.2673	114	90	110				S
Sulfate	25.96	1.0	25.00	0.7951	101	90	110				

Sample ID: **1805I16-001AMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218295**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.470	0.25	5.000	0.1019	107	90	110	5.441	0.530	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: R370650

Sample ID: **1805I16-001AMSD** Client ID:
SampleType: **MSD** TestCode: **ION SCAN SW9056A**
Units: **mg/L** Prep Date: Run No: **370650**
BatchID: **R370650** Analysis Date: **05/17/2018** Seq No: **8218295**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	25.28	1.0	25.00	0.3249	99.8	90	110	25.40	0.481	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H49

ANALYTICAL QC SUMMARY REPORT

BatchID: R370660

Sample ID: **MB-R370660**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218596**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370660**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218597**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.354	0.25	5.000		107	90	110				
Sulfate	25.72	1.0	25.00	0.2319	102	90	110				

Sample ID: **1805H97-001DMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218609**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.113	0.25	5.000	0.1534	119	90	110				S
Sulfate	27.27	1.0	25.00	1.368	104	90	110				

Sample ID: **1805H97-001DMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218610**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.107	0.25	5.000	0.1534	119	90	110	6.113	0.088	20	S
Sulfate	27.06	1.0	25.00	1.368	103	90	110	27.27	0.771	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

June 01, 2018

Rhonda Quinn
AMEC Foster Wheeler

1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805H68

Analytical Environmental Services, Inc. received 3 samples on 5/17/2018 4:50:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar

Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive, Atlanta GA 30340-3704

AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805H68

Date: 5/17/18 Page 1 of 1

COMPANY: Wood E+IS	ADDRESS: 1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: DHoward, BRhiner	SIGNATURE: Daniel Howard

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	VOC List 8260	T+T metals 6020	Dissmetals 6020	Pest 8081A	Nitrate Sulfate 9056	No # of Containers	REMARKS
	PRESERVATION (See codes)						H+I	N	I	I	I		
1	Trip Blank-08	5/17/18	0930	X		W	2					2	
2	MW-25	↓	1108	X		GW	2	1	1	2	1	7	
3	TW-10	↓	1127	X		GW	2	1	1	2	1	7	
4	Temp Blank												
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1: Daniel Howard	5/17/18/1554	1:	5-17-18 3:52
2:	5-17-18 4:50	2: Monique Allen	5/17/18 4:50pm
3:		3:	

PROJECT INFORMATION

PROJECT NAME: BFEL Atlanta

PROJECT #: 6122080154.28

SITE ADDRESS: 1525 Pine St Atlanta, GA

SEND REPORT TO: Rhonda Quinn

INVOICE TO: (IF DIFFERENT FROM ABOVE)

QUOTE #: PO#:

RECEIPT

Total # of Containers

Turnaround Time Request

- [X] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same Day Rush (auth req.)
- [ ] Other

STATE PROGRAM (if any):

E-mail? Fax?

DATA PACKAGE: I ○ II ○ III ● IV ○

SPECIAL INSTRUCTIONS/COMMENTS:

Lab will Filter dissolved metals

Metals: As, Pb, Cu, Zn

SHIPMENT METHOD:

OUT / / VIA:

IN / / VIA:

CLIENT FedEx UPS MAIL COURIER

GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY. IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.

SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc

Date: 1-Jun-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TRIP BLANK -08
Project Name:	BFEL Atlanta	**Collection Date:**	5/17/2018 9:30:00 AM
Lab ID:	1805H68-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 15:34	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 15:34	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 15:34	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 15:34	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 15:34	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 15:34	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 15:34	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 15:34	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 15:34	NP
Surr: 4-Bromofluorobenzene	98.4	68-127		%REC	261335	1	05/23/2018 15:34	NP
Surr: Dibromofluoromethane	93.2	84.4-122		%REC	261335	1	05/23/2018 15:34	NP
Surr: Toluene-d8	102	80.1-116		%REC	261335	1	05/23/2018 15:34	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 1-Jun-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-25
Project Name:	BFEL Atlanta	**Collection Date:**	5/17/2018 11:08:00 AM
Lab ID:	1805H68-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 16:00	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 16:00	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 16:00	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 16:00	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 16:00	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 16:00	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 16:00	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 16:00	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 16:00	NP
Surr: 4-Bromofluorobenzene	97.9	68-127		%REC	261335	1	05/23/2018 16:00	NP
Surr: Dibromofluoromethane	96.9	84.4-122		%REC	261335	1	05/23/2018 16:00	NP
Surr: Toluene-d8	104	80.1-116		%REC	261335	1	05/23/2018 16:00	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 1-Jun-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-25
Project Name:	BFEL Atlanta	**Collection Date:**	5/17/2018 11:08:00 AM
Lab ID:	1805H68-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	261020	1	05/22/2018 21:05	NG
Copper	0.396	0.0400		mg/L	261020	20	05/31/2018 00:20	NG
Lead	0.0146	0.00100		mg/L	261020	1	05/22/2018 21:05	NG
Zinc	4.42	0.200		mg/L	261020	20	05/31/2018 00:20	NG
ION SCAN SW9056A								
Nitrate	4.5	0.25		mg/L	R370660	1	05/17/2018 19:31	MP
Sulfate	330	20		mg/L	R370660	20	05/17/2018 19:52	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	261199	20	05/31/2018 01:55	NG
Copper	0.378	0.0400		mg/L	261199	20	05/31/2018 01:55	NG
Lead	0.0140	0.00100		mg/L	261199	1	05/25/2018 07:25	NG
Zinc	4.73	0.200		mg/L	261199	20	05/31/2018 19:35	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	261017	1	05/22/2018 01:25	UH
4,4´-DDE	BRL	0.00010		mg/L	261017	1	05/22/2018 01:25	UH
4,4´-DDT	BRL	0.00010		mg/L	261017	1	05/22/2018 01:25	UH
alpha-BHC	0.000082	0.000050		mg/L	261017	1	05/22/2018 01:25	UH
alpha-Chlordane	BRL	0.000050		mg/L	261017	1	05/22/2018 01:25	UH
beta-BHC	0.0034	0.00025		mg/L	261017	5	05/22/2018 17:17	UH
delta-BHC	0.00011	0.000050		mg/L	261017	1	05/22/2018 01:25	UH
Dieldrin	BRL	0.00010		mg/L	261017	1	05/22/2018 01:25	UH
gamma-BHC	BRL	0.000050		mg/L	261017	1	05/22/2018 01:25	UH
gamma-Chlordane	BRL	0.000050		mg/L	261017	1	05/22/2018 01:25	UH
Heptachlor	BRL	0.000050		mg/L	261017	1	05/22/2018 01:25	UH
Methoxychlor	BRL	0.00050		mg/L	261017	1	05/22/2018 01:25	UH
Toxaphene	BRL	0.0030		mg/L	261017	1	05/22/2018 01:25	UH
Surr: Decachlorobiphenyl	90.2	15.4-120		%REC	261017	1	05/22/2018 01:25	UH
Surr: Tetrachloro-m-xylene	72.9	37-126		%REC	261017	1	05/22/2018 01:25	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 1-Jun-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-10
Project Name:	BFEL Atlanta	**Collection Date:**	5/17/2018 11:27:00 AM
Lab ID:	1805H68-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
1,4-Dioxane	BRL	0.15		mg/L	261335	1	05/23/2018 16:26	NP
2-Butanone	BRL	0.050		mg/L	261335	1	05/23/2018 16:26	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261335	1	05/23/2018 16:26	NP
Acetone	BRL	0.050		mg/L	261335	1	05/23/2018 16:26	NP
Benzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Carbon disulfide	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Chlorobenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Chloroethane	BRL	0.010		mg/L	261335	1	05/23/2018 16:26	NP
Chloroform	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Chloromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Cyclohexane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Ethylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261335	1	05/23/2018 16:26	NP
Isopropylbenzene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Methylene chloride	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Naphthalene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Styrene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Tetrachloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Tetrahydrofuran	BRL	0.010		mg/L	261335	1	05/23/2018 16:26	NP
Toluene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Trichloroethene	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Vinyl chloride	BRL	0.0020		mg/L	261335	1	05/23/2018 16:26	NP
Xylenes, Total	BRL	0.0050		mg/L	261335	1	05/23/2018 16:26	NP
Surr: 4-Bromofluorobenzene	96.2	68-127		%REC	261335	1	05/23/2018 16:26	NP
Surr: Dibromofluoromethane	96.2	84.4-122		%REC	261335	1	05/23/2018 16:26	NP
Surr: Toluene-d8	103	80.1-116		%REC	261335	1	05/23/2018 16:26	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 1-Jun-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-10
Project Name:	BFEL Atlanta	**Collection Date:**	5/17/2018 11:27:00 AM
Lab ID:	1805H68-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	261020	1	05/22/2018 22:27	NG
Copper	9.45	0.0400		mg/L	261020	20	05/31/2018 00:52	NG
Lead	BRL	0.00100		mg/L	261020	1	05/22/2018 22:27	NG
Zinc	10.8	0.200		mg/L	261020	20	05/31/2018 00:52	NG
ION SCAN SW9056A								
Nitrate	1.9	0.25		mg/L	R370650	1	05/17/2018 18:13	MP
Sulfate	650	20		mg/L	R370650	20	05/17/2018 18:31	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.0100		mg/L	261199	100	05/31/2018 02:40	NG
Copper	10.4	0.200		mg/L	261199	100	05/31/2018 02:40	NG
Lead	BRL	0.00100		mg/L	261199	1	05/25/2018 07:57	NG
Zinc	11.6	1.00		mg/L	261199	100	05/31/2018 02:40	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	261017	1	05/22/2018 01:58	UH
4,4´-DDE	BRL	0.00010		mg/L	261017	1	05/22/2018 01:58	UH
4,4´-DDT	BRL	0.00010		mg/L	261017	1	05/22/2018 01:58	UH
alpha-BHC	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
alpha-Chlordane	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
beta-BHC	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
delta-BHC	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
Dieldrin	BRL	0.00010		mg/L	261017	1	05/22/2018 01:58	UH
gamma-BHC	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
gamma-Chlordane	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
Heptachlor	BRL	0.000050		mg/L	261017	1	05/22/2018 01:58	UH
Methoxychlor	BRL	0.00050		mg/L	261017	1	05/22/2018 01:58	UH
Toxaphene	BRL	0.0030		mg/L	261017	1	05/22/2018 01:58	UH
Surr: Decachlorobiphenyl	78.2	15.4-120		%REC	261017	1	05/22/2018 01:58	UH
Surr: Tetrachloro-m-xylene	72	37-126		%REC	261017	1	05/22/2018 01:58	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 1-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-25				**Lab ID:** 1805H68-002			
Collection Date: 5/17/2018 11:08:00 AM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.396		0.0372	0.0400	mg/L	261020	20
Lead	0.0146		0.000621	0.00100	mg/L	261020	1
Zinc	4.42		0.0336	0.200	mg/L	261020	20
ION SCAN SW9056A							
Nitrate	4.5		0.055	0.25	mg/L	R370660	1
Sulfate	330		2.3	20	mg/L	R370660	20
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.378		0.0372	0.0400	mg/L	261199	20
Lead	0.0140		0.000621	0.00100	mg/L	261199	1
Zinc	4.73		0.0336	0.200	mg/L	261199	20
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.000082		0.000018	0.000050	mg/L	261017	1
beta-BHC	0.0034		0.000077	0.00025	mg/L	261017	5
delta-BHC	0.00011		0.000014	0.000050	mg/L	261017	1
Client Sample ID: TW-10				**Lab ID:** 1805H68-003			
Collection Date: 5/17/2018 11:27:00 AM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	9.45		0.0372	0.0400	mg/L	261020	20
Zinc	10.8		0.0336	0.200	mg/L	261020	20
ION SCAN SW9056A							
Nitrate	1.9		0.055	0.25	mg/L	R370650	1
Sulfate	650		2.3	20	mg/L	R370650	20
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	10.4		0.186	0.200	mg/L	261199	100
Zinc	11.6		0.168	1.00	mg/L	261199	100

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear | Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Analytical Environmental Services, Inc

Date: 1-Jun-18

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805H68

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805H68-001A	TRIP BLANK -08	5/17/2018 9:30:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H68-002A	MW-25	5/17/2018 11:08:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H68-002B	MW-25	5/17/2018 11:08:00AM	Groundwater	Total Metals by ICP/MS		5/21/2018 1:08:00PM	05/22/2018
1805H68-002B	MW-25	5/17/2018 11:08:00AM	Groundwater	Total Metals by ICP/MS		5/21/2018 1:08:00PM	05/31/2018
1805H68-002C	MW-25	5/17/2018 11:08:00AM	Groundwater	Dissolved Metals by ICP/MS		5/23/2018 12:11:00PM	05/25/2018
1805H68-002C	MW-25	5/17/2018 11:08:00AM	Groundwater	Dissolved Metals by ICP/MS		5/23/2018 12:11:00PM	05/31/2018
1805H68-002D	MW-25	5/17/2018 11:08:00AM	Groundwater	Pesticides and PCBs		5/21/2018 9:00:00AM	05/22/2018
1805H68-002D	MW-25	5/17/2018 11:08:00AM	Groundwater	APPENDIX II CHLORINATED PESTICIDE		5/21/2018 12:00:00PM	05/22/2018
1805H68-002D	MW-25	5/17/2018 11:08:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/22/2018 9:00:00AM	05/22/2018
1805H68-002D	MW-25	5/17/2018 11:08:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/21/2018 12:00:00PM	05/22/2018
1805H68-002E	MW-25	5/17/2018 11:08:00AM	Groundwater	ION SCAN			05/17/2018
1805H68-003A	TW-10	5/17/2018 11:27:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/23/2018 9:48:00AM	05/23/2018
1805H68-003B	TW-10	5/17/2018 11:27:00AM	Groundwater	Total Metals by ICP/MS		5/21/2018 1:08:00PM	05/22/2018
1805H68-003B	TW-10	5/17/2018 11:27:00AM	Groundwater	Total Metals by ICP/MS		5/21/2018 1:08:00PM	05/31/2018
1805H68-003C	TW-10	5/17/2018 11:27:00AM	Groundwater	Dissolved Metals by ICP/MS		5/23/2018 12:11:00PM	05/25/2018
1805H68-003C	TW-10	5/17/2018 11:27:00AM	Groundwater	Dissolved Metals by ICP/MS		5/23/2018 12:11:00PM	05/31/2018
1805H68-003D	TW-10	5/17/2018 11:27:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/21/2018 12:00:00PM	05/22/2018
1805H68-003E	TW-10	5/17/2018 11:27:00AM	Groundwater	ION SCAN			05/17/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261017

Sample ID: **MB-261017** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **370940**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **261017** Analysis Date: **05/21/2018** Seq No: **8225718**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000392	0	0.0005		78.4	15.4	120				
Surr: Tetrachloro-m-xylene	0.000420	0	0.0005		84.0	37	126				

Sample ID: **LCS-261017** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **370940**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **261017** Analysis Date: **05/21/2018** Seq No: **8225719**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000950	0.00010	0.0010		95.0	61.9	135				
Dieldrin	0.000901	0.00010	0.0010		90.1	70.3	126				
gamma-BHC	0.000960	0.000050	0.0010		96.0	70.9	129				
Heptachlor	0.000950	0.000050	0.0010		95.0	63.5	128				
Surr: Decachlorobiphenyl	0.000455	0	0.0005		90.9	15.4	120				
Surr: Tetrachloro-m-xylene	0.000456	0	0.0005		91.3	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261017

Sample ID: **1805H68-002DMS**	Client ID: **MW-25**	Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **370940**
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **261017**	Analysis Date: **05/22/2018**	Seq No: **8225725**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001021	0.00010	0.0010		102	43.2	136				
Dieldrin	0.000964	0.00010	0.0010		96.4	44	139				
gamma-BHC	0.001038	0.000050	0.0010	0.00003488	100	53.8	141				
Heptachlor	0.000901	0.000050	0.0010		90.1	34.3	144				
Surr: Decachlorobiphenyl	0.000452	0	0.0005		90.4	15.4	120				
Surr: Tetrachloro-m-xylene	0.000368	0	0.0005		73.6	37	126				

Sample ID: **1805H68-002DMSD**	Client ID: **MW-25**	Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **370940**
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **261017**	Analysis Date: **05/22/2018**	Seq No: **8225726**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001006	0.00010	0.0010		101	43.2	136	0.001021	1.53	21.1	
Dieldrin	0.000932	0.00010	0.0010		93.2	44	139	0.0009644	3.41	20	
gamma-BHC	0.001006	0.000050	0.0010	0.00003488	97.1	53.8	141	0.001038	3.17	20	
Heptachlor	0.000891	0.000050	0.0010		89.1	34.3	144	0.0009010	1.07	24.4	
Surr: Decachlorobiphenyl	0.000436	0	0.0005		87.1	15.4	120	0.0004518	0	0	
Surr: Tetrachloro-m-xylene	0.000353	0	0.0005		70.6	37	126	0.0003680	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261020

Sample ID: **MB-261020** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **371095**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **261020** Analysis Date: **05/22/2018** Seq No: **8230257**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-261020** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **371095**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **261020** Analysis Date: **05/22/2018** Seq No: **8230258**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1182	0.00500	0.1000		118	80	120				
Copper	0.1056	0.00200	0.1000		106	80	120				
Lead	0.1112	0.00100	0.1000		111	80	120				
Zinc	0.1038	0.0100	0.1000		104	80	120				

Sample ID: **1805H68-002BMS** Client ID: **MW-25** Units: **mg/L** Prep Date: **05/21/2018** Run No: **371095**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **261020** Analysis Date: **05/22/2018** Seq No: **8230260**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1199	0.00500	0.1000		120	75	125				
Lead	0.1271	0.00100	0.1000	0.01459	112	75	125				

Sample ID: **1805H68-002BMS** Client ID: **MW-25** Units: **mg/L** Prep Date: **05/21/2018** Run No: **371095**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **261020** Analysis Date: **05/31/2018** Seq No: **8244908**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.4865	0.0400	0.1000	0.3955	91.0	75	125				
Zinc	4.303	0.200	0.1000	4.416	-113	75	125				S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261020

Sample ID: **1805H68-002BMSD**	Client ID: **MW-25**				Units: **mg/L**		Prep Date: **05/21/2018**		Run No: **371095**	
SampleType: **MSD**	TestCode: **Total Metals by ICP/MS SW6020B**				BatchID: **261020**		Analysis Date: **05/22/2018**		Seq No: **8230261**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1113	0.00500	0.1000		111	75	125	0.1199	7.41	20	
Lead	0.1178	0.00100	0.1000	0.01459	103	75	125	0.1271	7.59	20	

Sample ID: **1805H68-002BMSD**	Client ID: **MW-25**				Units: **mg/L**		Prep Date: **05/21/2018**		Run No: **371095**	
SampleType: **MSD**	TestCode: **Total Metals by ICP/MS SW6020B**				BatchID: **261020**		Analysis Date: **05/31/2018**		Seq No: **8244909**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.4784	0.0400	0.1000	0.3955	82.9	75	125	0.4865	1.67	20	
Zinc	4.233	0.200	0.1000	4.416	-182	75	125	4.303	1.62	20	S

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261199

Sample ID: **MB-261199** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MBLK** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/31/2018** Seq No: **8245207**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-261199** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/25/2018** Seq No: **8236593**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Lead	0.1034	0.00100	0.1000		103	80	120				
Zinc	0.09168	0.0100	0.1000	0.001850	89.8	80	120				

Sample ID: **LCS-261199** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/31/2018** Seq No: **8245208**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09301	0.00500	0.1000		93.0	80	120				
Copper	0.09649	0.00200	0.1000		96.5	80	120				

Sample ID: **1805H68-002CMS** Client ID: **MW-25** Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/25/2018** Seq No: **8236595**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.08412	0.00500	0.1000		84.1	75	125				
Lead	0.1133	0.00100	0.1000	0.01399	99.3	75	125				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261199

Sample ID: **1805H68-002CMS**	Client ID: **MW-25**					Units: **mg/L**		Prep Date: **05/23/2018**		Run No: **371297**	
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**					BatchID: **261199**		Analysis Date: **05/31/2018**		Seq No: **8245210**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.4388	0.0400	0.1000	0.3778	61.0	75	125				S
Zinc	4.062	0.200	0.1000	4.062	-0.432	75	125				S

Sample ID: **1805H68-002CMSD**	Client ID: **MW-25**					Units: **mg/L**		Prep Date: **05/23/2018**		Run No: **371297**	
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**					BatchID: **261199**		Analysis Date: **05/25/2018**		Seq No: **8236596**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.08090	0.00500	0.1000		80.9	75	125	0.08412	3.90	20	
Lead	0.1118	0.00100	0.1000	0.01399	97.8	75	125	0.1133	1.35	20	

Sample ID: **1805H68-002CMSD**	Client ID: **MW-25**					Units: **mg/L**		Prep Date: **05/23/2018**		Run No: **371297**	
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**					BatchID: **261199**		Analysis Date: **05/31/2018**		Seq No: **8245211**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.4418	0.0400	0.1000	0.3778	64.0	75	125	0.4388	0.675	20	S
Zinc	4.045	0.200	0.1000	4.062	-17.3	75	125	4.062	0.417	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **MB-261335** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371148**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/23/2018** Seq No: **8231842**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									
Styrene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **MB-261335** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371148**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/23/2018** Seq No: **8231842**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	0.0050									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04844	0	0.0500		96.9	68	127				
Surr: Dibromofluoromethane	0.04824	0	0.0500		96.5	84.4	122				
Surr: Toluene-d8	0.05090	0	0.0500		102	80.1	116				

Sample ID: **MB-261335** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371148**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/23/2018** Seq No: **8231972**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Isobutyl Alcohol	BRL	0.20									
Tetrahydrofuran	BRL	0.010									

Sample ID: **LCS-261335** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371163**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261335** Analysis Date: **05/24/2018** Seq No: **8232846**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.05425	0.0050	0.0500		108	69	136				
Benzene	0.05042	0.0050	0.0500		101	73.7	126				
Chlorobenzene	0.05078	0.0050	0.0500		102	73.5	124				
Toluene	0.04719	0.0050	0.0500		94.4	76.8	125				
Trichloroethene	0.04951	0.0050	0.0500		99.0	70.9	124				
Surr: 4-Bromofluorobenzene	0.04697	0	0.0500		93.9	68	127				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: 261335

Sample ID: **LCS-261335**	Client ID:		Units: **mg/L**	Prep Date: **05/23/2018**	Run No: **371163**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261335**	Analysis Date: **05/24/2018**	Seq No: **8232846**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: Dibromofluoromethane	0.04542	0	0.0500		90.8	84.4	122				
Surr: Toluene-d8	0.05132	0	0.0500		103	80.1	116				

Sample ID: **1805H68-002AMS**	Client ID: **MW-25**		Units: **mg/L**	Prep Date: **05/23/2018**	Run No: **371148**
SampleType: **MS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261335**	Analysis Date: **05/23/2018**	Seq No: **8231860**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04590	0.0050	0.0500		91.8	65.7	143				
Benzene	0.04645	0.0050	0.0500		92.9	66.1	137				
Chlorobenzene	0.04820	0.0050	0.0500		96.4	70.9	132				
Toluene	0.04446	0.0050	0.0500		88.9	63.8	141				
Trichloroethene	0.04597	0.0050	0.0500		91.9	70.6	128				
Surr: 4-Bromofluorobenzene	0.04809	0	0.0500		96.2	68	127				
Surr: Dibromofluoromethane	0.04721	0	0.0500		94.4	84.4	122				
Surr: Toluene-d8	0.05131	0	0.0500		103	80.1	116				

Sample ID: **1805H68-002AMSD**	Client ID: **MW-25**		Units: **mg/L**	Prep Date: **05/23/2018**	Run No: **371148**
SampleType: **MSD**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261335**	Analysis Date: **05/23/2018**	Seq No: **8231861**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04106	0.0050	0.0500		82.1	65.7	143	0.04590	11.1	17.7	
Benzene	0.04754	0.0050	0.0500		95.1	66.1	137	0.04645	2.32	20	
Chlorobenzene	0.05024	0.0050	0.0500		100	70.9	132	0.04820	4.14	20	
Toluene	0.04507	0.0050	0.0500		90.1	63.8	141	0.04446	1.36	20	
Trichloroethene	0.04587	0.0050	0.0500		91.7	70.6	128	0.04597	0.218	20	
Surr: 4-Bromofluorobenzene	0.04856	0	0.0500		97.1	68	127	0.04809	0	0	
Surr: Dibromofluoromethane	0.04801	0	0.0500		96.0	84.4	122	0.04721	0	0	
Surr: Toluene-d8	0.05171	0	0.0500		103	80.1	116	0.05131	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: R370650

Sample ID: **MB-R370650**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218283**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370650**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218282**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.436	0.25	5.000		109	90	110				
Sulfate	24.63	1.0	25.00		98.5	90	110				

Sample ID: **1805I16-001AMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218294**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.441	0.25	5.000	0.1019	107	90	110				
Sulfate	25.40	1.0	25.00	0.3249	100	90	110				

Sample ID: **1805I18-001AMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218296**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.958	0.25	5.000	0.2673	114	90	110				S
Sulfate	25.96	1.0	25.00	0.7951	101	90	110				

Sample ID: **1805I16-001AMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370650**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370650**		Analysis Date: **05/17/2018**		Seq No: **8218295**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.470	0.25	5.000	0.1019	107	90	110	5.441	0.530	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: R370650

Sample ID: **1805I16-001AMSD** Client ID:
SampleType: **MSD** TestCode: **ION SCAN SW9056A**
Units: **mg/L** Prep Date: Run No: **370650**
BatchID: **R370650** Analysis Date: **05/17/2018** Seq No: **8218295**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	25.28	1.0	25.00	0.3249	99.8	90	110	25.40	0.481	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805H68

ANALYTICAL QC SUMMARY REPORT

BatchID: R370660

Sample ID: **MB-R370660**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218596**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370660**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218597**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.354	0.25	5.000		107	90	110				
Sulfate	25.72	1.0	25.00	0.2319	102	90	110				

Sample ID: **1805H97-001DMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218609**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.113	0.25	5.000	0.1534	119	90	110				S
Sulfate	27.27	1.0	25.00	1.368	104	90	110				

Sample ID: **1805H97-001DMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370660**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370660**		Analysis Date: **05/17/2018**		Seq No: **8218610**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.107	0.25	5.000	0.1534	119	90	110	6.113	0.088	20	S
Sulfate	27.06	1.0	25.00	1.368	103	90	110	27.27	0.771	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

AES

June 14, 2018

Rhonda Quinn
Wood Environment & Infrastructure
1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805K73

Analytical Environmental Services, Inc. received 9 samples on 5/18/2018 2:20:00 PM
for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar
Project Manager

Revision 6/14/2018

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805K73

Date: 5/18/18 Page 1 of 1

COMPANY:	ADDRESS:
Wood E+IS	1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144
PHONE: 770-421-3400	EMAIL:
SAMPLED BY: D Howard, Ben Rhiner	SIGNATURE: Daniel Howard

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	PRESERVATION (see codes)	ANALYSIS REQUESTED: Dissmetals 6020*	Pest 8081A	Nitrate Sulfate 9056	REMARKS	Number of Containers
1	SW-2010-17	5/18/18	0955	X		SW	1	2	1			4
2	SW-2010-15		1010	X		SW	1	2	1			4
3	SW-2010-14		1025	X		SW	1	2	1			4
4	SW-2014-20		1100	X		SW	1	2	1			4
5	SW-2014-21		1111	X		SW	1	2	1			4
6	SW-2010-11		1125	X		SW	1	2	1			4
7	DUP-5		1200	X		SW	1	2	1			4
8	SW-2010-10		1144	X		SW	1	2	1			4
9	SW-2010-5		1201	X		SW	1	2	1			4
10	Temp Blank											
11												
12												
13												
14												

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1. Daniel Howard	5/18/18/1417	1. Monique Alonica	5/18/18 2:20pm
2.		2.	
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:
* Lab will filter dissolved metals
Metals: As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
(client) FedEx UPS US mail courier Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: BFEL Atlanta
PROJECT #: 612308015 4.028
SITE ADDRESS: 1525 Pine St Atlanta, GA
SEND REPORT TO: Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ● III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2010-17
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 9:55:00 AM
Lab ID:	1805K73-001	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.3		0.055	0.25	mg/L	R370740	1	05/18/2018 19:00	MP
Sulfate	88		0.12	1.0	mg/L	R370740	1	05/18/2018 19:00	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00240	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 02:59	NG
Copper	0.0251		0.00186	0.00200	mg/L	261199	1	05/25/2018 08:41	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 08:41	NG
Zinc	0.587		0.00168	0.0100	mg/L	261199	1	05/31/2018 19:41	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 02:43	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 02:43	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 02:43	UH
alpha-BHC	0.00020		0.000010	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
beta-BHC	0.00030		0.000004	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
delta-BHC	0.00021		0.000009	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
Dieldrin	BRL		0.000005	0.00010	mg/L	261017	1	05/22/2018 02:43	UH
gamma-BHC	0.000091		0.000005	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 02:43	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 02:43	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 02:43	UH
Surr: Decachlorobiphenyl	80.5		0	15.4-120	%REC	261017	1	05/22/2018 02:43	UH
Surr: Tetrachloro-m-xylene	166	S	0	37-126	%REC	261017	1	05/22/2018 02:43	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2010-15
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 10:10:00 AM
Lab ID:	1805K73-002	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.4		0.055	0.25	mg/L	R370740	1	05/18/2018 19:15	MP
Sulfate	90		0.12	1.0	mg/L	R370740	1	05/18/2018 19:15	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00241	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 03:05	NG
Copper	0.0230		0.00186	0.00200	mg/L	261199	1	05/25/2018 08:48	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 08:48	NG
Zinc	0.641		0.00168	0.0100	mg/L	261199	1	05/31/2018 19:48	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 02:54	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 02:54	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 02:54	UH
alpha-BHC	0.00020		0.000010	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
beta-BHC	0.00030		0.000004	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
delta-BHC	0.00021		0.000009	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
Dieldrin	BRL		0.000005	0.00010	mg/L	261017	1	05/22/2018 02:54	UH
gamma-BHC	0.000084		0.000005	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 02:54	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 02:54	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 02:54	UH
Surr: Decachlorobiphenyl	76.7		0	15.4-120	%REC	261017	1	05/22/2018 02:54	UH
Surr: Tetrachloro-m-xylene	167	S	0	37-126	%REC	261017	1	05/22/2018 02:54	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2010-14
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 10:25:00 AM
Lab ID:	1805K73-003	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.4		0.055	0.25	mg/L	R370740	1	05/18/2018 19:30	MP
Sulfate	92		0.12	1.0	mg/L	R370740	1	05/18/2018 19:30	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00211	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 03:11	NG
Copper	0.0242		0.00186	0.00200	mg/L	261199	1	05/25/2018 08:54	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 08:54	NG
Zinc	0.721		0.00168	0.0100	mg/L	261199	1	05/31/2018 19:54	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 17:51	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 17:51	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 17:51	UH
alpha-BHC	0.00026		0.000010	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
beta-BHC	0.00036		0.000004	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
delta-BHC	0.00016		0.000009	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
Dieldrin	0.0000083	J	0.000005	0.00010	mg/L	261017	1	05/22/2018 17:51	UH
gamma-BHC	0.00010		0.000005	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 17:51	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 17:51	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 17:51	UH
Surr: Decachlorobiphenyl	86.5		0	15.4-120	%REC	261017	1	05/22/2018 17:51	UH
Surr: Tetrachloro-m-xylene	113		0	37-126	%REC	261017	1	05/22/2018 17:51	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2014-20
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 11:00:00 AM
Lab ID:	1805K73-004	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	5.4		0.055	0.25	mg/L	R370740	1	05/18/2018 19:45	MP
Sulfate	200		1.2	10	mg/L	R370740	10	05/18/2018 20:15	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	BRL		0.0410	0.00500	mg/L	261199	20	05/31/2018 03:18	NG
Copper	0.119		0.00186	0.00200	mg/L	261199	1	05/25/2018 09:00	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 09:00	NG
Zinc	3.20		0.0336	0.200	mg/L	261199	20	05/31/2018 03:18	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 18:02	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 18:02	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 18:02	UH
alpha-BHC	0.00018		0.000010	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
beta-BHC	0.0011		0.000004	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
delta-BHC	0.00010		0.000009	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
Dieldrin	0.000023	J	0.000005	0.00010	mg/L	261017	1	05/22/2018 18:02	UH
gamma-BHC	0.00011		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:02	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 18:02	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 18:02	UH
Surr: Decachlorobiphenyl	83.1		0	15.4-120	%REC	261017	1	05/22/2018 18:02	UH
Surr: Tetrachloro-m-xylene	88.5		0	37-126	%REC	261017	1	05/22/2018 18:02	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2014-21
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 11:11:00 AM
Lab ID:	1805K73-005	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	5.4		0.055	0.25	mg/L	R370740	1	05/18/2018 20:00	MP
Sulfate	190		1.2	10	mg/L	R370740	10	05/18/2018 20:30	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	BRL		0.0410	0.00500	mg/L	261199	20	05/31/2018 03:24	NG
Copper	0.140		0.00186	0.00200	mg/L	261199	1	05/25/2018 09:07	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 09:07	NG
Zinc	3.41		0.0336	0.200	mg/L	261199	20	05/31/2018 03:24	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 18:13	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 18:13	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 18:13	UH
alpha-BHC	0.00014		0.000010	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
beta-BHC	0.0012		0.000004	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
delta-BHC	0.000100		0.000009	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
Dieldrin	0.000030	J	0.000005	0.00010	mg/L	261017	1	05/22/2018 18:13	UH
gamma-BHC	0.000091		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:13	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 18:13	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 18:13	UH
Surr: Decachlorobiphenyl	87.4		0	15.4-120	%REC	261017	1	05/22/2018 18:13	UH
Surr: Tetrachloro-m-xylene	89.5		0	37-126	%REC	261017	1	05/22/2018 18:13	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2010-11
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 11:25:00 AM
Lab ID:	1805K73-006	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.0		0.055	0.25	mg/L	R370739	1	05/18/2018 17:24	MP
Sulfate	62		0.12	1.0	mg/L	R370739	1	05/18/2018 17:24	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00434	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 03:43	NG
Copper	0.0127		0.00186	0.00200	mg/L	261199	1	05/25/2018 09:13	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 09:13	NG
Zinc	0.182		0.00168	0.0100	mg/L	261199	1	05/31/2018 03:43	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 18:25	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 18:25	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 18:25	UH
alpha-BHC	0.00012		0.000010	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
beta-BHC	0.000046	J	0.000004	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
delta-BHC	0.000050	J	0.000009	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
Dieldrin	BRL		0.000005	0.00010	mg/L	261017	1	05/22/2018 18:25	UH
gamma-BHC	0.000070		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:25	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 18:25	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 18:25	UH
Surr: Decachlorobiphenyl	77.1		0	15.4-120	%REC	261017	1	05/22/2018 18:25	UH
Surr: Tetrachloro-m-xylene	123		0	37-126	%REC	261017	1	05/22/2018 18:25	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	DUP-5
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 12:00:00 PM
Lab ID:	1805K73-007	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.1		0.055	0.25	mg/L	R370739	1	05/18/2018 17:39	MP
Sulfate	63		0.12	1.0	mg/L	R370739	1	05/18/2018 17:39	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00459	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 03:49	NG
Copper	0.0105		0.00186	0.00200	mg/L	261199	1	05/25/2018 09:19	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 09:19	NG
Zinc	0.196		0.00168	0.0100	mg/L	261199	1	05/25/2018 09:19	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 18:36	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 18:36	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 18:36	UH
alpha-BHC	0.00012		0.000010	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
beta-BHC	0.000056		0.000004	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
delta-BHC	0.000055		0.000009	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
Dieldrin	BRL		0.000005	0.00010	mg/L	261017	1	05/22/2018 18:36	UH
gamma-BHC	0.000078		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:36	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 18:36	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 18:36	UH
Surr: Decachlorobiphenyl	86.4		0	15.4-120	%REC	261017	1	05/22/2018 18:36	UH
Surr: Tetrachloro-m-xylene	124		0	37-126	%REC	261017	1	05/22/2018 18:36	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2010-10
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 11:44:00 AM
Lab ID:	1805K73-008	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.0		0.055	0.25	mg/L	R370739	1	05/18/2018 17:54	MP
Sulfate	63		0.12	1.0	mg/L	R370739	1	05/18/2018 17:54	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00384	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 03:56	NG
Copper	0.00983		0.00186	0.00200	mg/L	261199	1	05/25/2018 09:26	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 09:26	NG
Zinc	0.190		0.00168	0.0100	mg/L	261199	1	05/25/2018 09:26	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 03:05	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 03:05	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 03:05	UH
alpha-BHC	0.00012		0.000010	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
beta-BHC	BRL		0.000004	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
delta-BHC	0.00016		0.000009	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
Dieldrin	BRL		0.000005	0.00010	mg/L	261017	1	05/22/2018 03:05	UH
gamma-BHC	0.000074		0.000005	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 03:05	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 03:05	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 03:05	UH
Surr: Decachlorobiphenyl	79.8		0	15.4-120	%REC	261017	1	05/22/2018 03:05	UH
Surr: Tetrachloro-m-xylene	245	S	0	37-126	%REC	261017	1	05/22/2018 03:05	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 14-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	SW-2010-5
Project Name:	BFEL Atlanta	**Collection Date:**	5/18/2018 12:01:00 PM
Lab ID:	1805K73-009	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
ION SCAN SW9056A									
Nitrate	1.0		0.055	0.25	mg/L	R370739	1	05/18/2018 18:09	MP
Sulfate	62		0.12	1.0	mg/L	R370739	1	05/18/2018 18:09	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**				
Arsenic	0.00400	J	0.00205	0.00500	mg/L	261199	1	05/31/2018 04:02	NG
Copper	0.00966		0.00186	0.00200	mg/L	261199	1	05/25/2018 09:32	NG
Lead	BRL		0.000621	0.00100	mg/L	261199	1	05/25/2018 09:32	NG
Zinc	0.307		0.00168	0.0100	mg/L	261199	1	05/31/2018 20:00	NG
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**				
4,4´-DDD	BRL		0.000014	0.00010	mg/L	261017	1	05/22/2018 18:47	UH
4,4´-DDE	BRL		0.000010	0.00010	mg/L	261017	1	05/22/2018 18:47	UH
4,4´-DDT	BRL		0.000007	0.00010	mg/L	261017	1	05/22/2018 18:47	UH
alpha-BHC	0.000052		0.000010	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
alpha-Chlordane	BRL		0.000020	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
beta-BHC	0.000033	J	0.000004	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
delta-BHC	0.000024	J	0.000009	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
Dieldrin	BRL		0.000005	0.00010	mg/L	261017	1	05/22/2018 18:47	UH
gamma-BHC	0.000035	J	0.000005	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
gamma-Chlordane	BRL		0.000013	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
Heptachlor	BRL		0.000005	0.000050	mg/L	261017	1	05/22/2018 18:47	UH
Methoxychlor	BRL		0.000030	0.00050	mg/L	261017	1	05/22/2018 18:47	UH
Toxaphene	BRL		0.000062	0.0030	mg/L	261017	1	05/22/2018 18:47	UH
Surr: Decachlorobiphenyl	78.7		0	15.4-120	%REC	261017	1	05/22/2018 18:47	UH
Surr: Tetrachloro-m-xylene	125		0	37-126	%REC	261017	1	05/22/2018 18:47	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc

Date: 14-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: SW-2010-17				**Lab ID:** 1805K73-001			
Collection Date: 5/18/2018 9:55:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.3		0.055	0.25	mg/L	R370740	1
Sulfate	88		0.12	1.0	mg/L	R370740	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0251		0.00186	0.00200	mg/L	261199	1
Zinc	0.587		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00020		0.000010	0.000050	mg/L	261017	1
beta-BHC	0.00030		0.000004	0.000050	mg/L	261017	1
delta-BHC	0.00021		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.000091		0.000005	0.000050	mg/L	261017	1
Client Sample ID: SW-2010-15				**Lab ID:** 1805K73-002			
Collection Date: 5/18/2018 10:10:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.4		0.055	0.25	mg/L	R370740	1
Sulfate	90		0.12	1.0	mg/L	R370740	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0230		0.00186	0.00200	mg/L	261199	1
Zinc	0.641		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00020		0.000010	0.000050	mg/L	261017	1
beta-BHC	0.00030		0.000004	0.000050	mg/L	261017	1
delta-BHC	0.00021		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.000084		0.000005	0.000050	mg/L	261017	1
Client Sample ID: SW-2010-14				**Lab ID:** 1805K73-003			
Collection Date: 5/18/2018 10:25:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.4		0.055	0.25	mg/L	R370740	1
Sulfate	92		0.12	1.0	mg/L	R370740	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0242		0.00186	0.00200	mg/L	261199	1
Zinc	0.721		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00026		0.000010	0.000050	mg/L	261017	1
beta-BHC	0.00036		0.000004	0.000050	mg/L	261017	1
delta-BHC	0.00016		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.00010		0.000005	0.000050	mg/L	261017	1
Client Sample ID: SW-2014-20				**Lab ID:** 1805K73-004			
Collection Date: 5/18/2018 11:00:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	5.4		0.055	0.25	mg/L	R370740	1
Sulfate	200		1.2	10	mg/L	R370740	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.119		0.00186	0.00200	mg/L	261199	1

Analytical Environmental Services, Inc

Date: 14-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: SW-2014-20				**Lab ID:** 1805K73-004			
Collection Date: 5/18/2018 11:00:00 AM				**Matrix:** Surface Water			
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	3.20		0.0336	0.200	mg/L	261199	20
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00018		0.000010	0.000050	mg/L	261017	1
beta-BHC	0.0011		0.000004	0.000050	mg/L	261017	1
delta-BHC	0.00010		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.00011		0.000005	0.000050	mg/L	261017	1
Client Sample ID: SW-2014-21				**Lab ID:** 1805K73-005			
Collection Date: 5/18/2018 11:11:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	5.4		0.055	0.25	mg/L	R370740	1
Sulfate	190		1.2	10	mg/L	R370740	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.140		0.00186	0.00200	mg/L	261199	1
Zinc	3.41		0.0336	0.200	mg/L	261199	20
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00014		0.000010	0.000050	mg/L	261017	1
beta-BHC	0.0012		0.000004	0.000050	mg/L	261017	1
delta-BHC	0.000100		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.000091		0.000005	0.000050	mg/L	261017	1
Client Sample ID: SW-2010-11				**Lab ID:** 1805K73-006			
Collection Date: 5/18/2018 11:25:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.0		0.055	0.25	mg/L	R370739	1
Sulfate	62		0.12	1.0	mg/L	R370739	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0127		0.00186	0.00200	mg/L	261199	1
Zinc	0.182		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00012		0.000010	0.000050	mg/L	261017	1
gamma-BHC	0.000070		0.000005	0.000050	mg/L	261017	1
Client Sample ID: DUP-5				**Lab ID:** 1805K73-007			
Collection Date: 5/18/2018 12:00:00 PM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.1		0.055	0.25	mg/L	R370739	1
Sulfate	63		0.12	1.0	mg/L	R370739	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0105		0.00186	0.00200	mg/L	261199	1
Zinc	0.196		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00012		0.000010	0.000050	mg/L	261017	1
beta-BHC	0.000056		0.000004	0.000050	mg/L	261017	1
delta-BHC	0.000055		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.000078		0.000005	0.000050	mg/L	261017	1

Analytical Environmental Services, Inc

Date: 14-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: SW-2010-10				**Lab ID:** 1805K73-008			
Collection Date: 5/18/2018 11:44:00 AM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.0		0.055	0.25	mg/L	R370739	1
Sulfate	63		0.12	1.0	mg/L	R370739	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00983		0.00186	0.00200	mg/L	261199	1
Zinc	0.190		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00012		0.000010	0.000050	mg/L	261017	1
delta-BHC	0.00016		0.000009	0.000050	mg/L	261017	1
gamma-BHC	0.000074		0.000005	0.000050	mg/L	261017	1
Client Sample ID: SW-2010-5				**Lab ID:** 1805K73-009			
Collection Date: 5/18/2018 12:01:00 PM				**Matrix:** Surface Water			
ION SCAN SW9056A							
Nitrate	1.0		0.055	0.25	mg/L	R370739	1
Sulfate	62		0.12	1.0	mg/L	R370739	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00966		0.00186	0.00200	mg/L	261199	1
Zinc	0.307		0.00168	0.0100	mg/L	261199	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.000052		0.000010	0.000050	mg/L	261017	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Locked

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: 261017

Sample ID: **MB-261017** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **370940**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **261017** Analysis Date: **05/21/2018** Seq No: **8225718**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000392	0	0.0005		78.4	15.4	120				
Surr: Tetrachloro-m-xylene	0.000420	0	0.0005		84.0	37	126				

Sample ID: **LCS-261017** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **370940**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **261017** Analysis Date: **05/21/2018** Seq No: **8225719**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000950	0.00010	0.0010		95.0	61.9	135				
Dieldrin	0.000901	0.00010	0.0010		90.1	70.3	126				
gamma-BHC	0.000960	0.000050	0.0010		96.0	70.9	129				
Heptachlor	0.000950	0.000050	0.0010		95.0	63.5	128				
Surr: Decachlorobiphenyl	0.000455	0	0.0005		90.9	15.4	120				
Surr: Tetrachloro-m-xylene	0.000456	0	0.0005		91.3	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: 261017

Sample ID: **1805H68-002DMS** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **370940**
SampleType: **MS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **261017** Analysis Date: **05/22/2018** Seq No: **8225725**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001021	0.00010	0.0010		102	43.2	136				
Dieldrin	0.000964	0.00010	0.0010		96.4	44	139				
gamma-BHC	0.001038	0.000050	0.0010	0.00003488	100	53.8	141				
Heptachlor	0.000901	0.000050	0.0010		90.1	34.3	144				
Surr: Decachlorobiphenyl	0.000452	0	0.0005		90.4	15.4	120				
Surr: Tetrachloro-m-xylene	0.000368	0	0.0005		73.6	37	126				

Sample ID: **1805H68-002DMSD** Client ID: Units: **mg/L** Prep Date: **05/21/2018** Run No: **370940**
SampleType: **MSD** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **261017** Analysis Date: **05/22/2018** Seq No: **8225726**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001006	0.00010	0.0010		101	43.2	136	0.001021	1.53	21.1	
Dieldrin	0.000932	0.00010	0.0010		93.2	44	139	0.0009644	3.41	20	
gamma-BHC	0.001006	0.000050	0.0010	0.00003488	97.1	53.8	141	0.001038	3.17	20	
Heptachlor	0.000891	0.000050	0.0010		89.1	34.3	144	0.0009010	1.07	24.4	
Surr: Decachlorobiphenyl	0.000436	0	0.0005		87.1	15.4	120	0.0004518	0	0	
Surr: Tetrachloro-m-xylene	0.000353	0	0.0005		70.6	37	126	0.0003680	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: 261199

Sample ID: **MB-261199** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MBLK** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/31/2018** Seq No: **8245207**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	0.001850	0.0100									J

Sample ID: **LCS-261199** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/25/2018** Seq No: **8236593**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Lead	0.1034	0.00100	0.1000		103	80	120				
Zinc	0.09168	0.0100	0.1000	0.001850	89.8	80	120				

Sample ID: **LCS-261199** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/31/2018** Seq No: **8245208**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09301	0.00500	0.1000		93.0	80	120				
Copper	0.09649	0.00200	0.1000		96.5	80	120				

Sample ID: **1805H68-002CMS** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/25/2018** Seq No: **8236595**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.08412	0.00500	0.1000		84.1	75	125				
Lead	0.1133	0.00100	0.1000	0.01399	99.3	75	125				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: 261199

Sample ID: **1805H68-002CMS** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/31/2018** Seq No: **8245210**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.4388	0.0400	0.1000	0.3778	61.0	75	125				S
Zinc	4.062	0.200	0.1000	4.062	-0.432	75	125				S

Sample ID: **1805H68-002CMSD** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/25/2018** Seq No: **8236596**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.08090	0.00500	0.1000		80.9	75	125	0.08412	3.90	20	
Lead	0.1118	0.00100	0.1000	0.01399	97.8	75	125	0.1133	1.35	20	

Sample ID: **1805H68-002CMSD** Client ID: Units: **mg/L** Prep Date: **05/23/2018** Run No: **371297**
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **261199** Analysis Date: **05/31/2018** Seq No: **8245211**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.4418	0.0400	0.1000	0.3778	64.0	75	125	0.4388	0.675	20	S
Zinc	4.045	0.200	0.1000	4.062	-17.3	75	125	4.062	0.417	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: R370739

Sample ID: **MB-R370739**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370739**
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**			BatchID: **R370739**	Analysis Date: **05/18/2018**		Seq No: **8220754**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	0.2232	1.0									J

Sample ID: **LCS-R370739**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370739**
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370739**	Analysis Date: **05/18/2018**		Seq No: **8220753**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.389	0.25	5.000		108	90	110				
Sulfate	24.62	1.0	25.00		98.5	90	110				

Sample ID: **1805K45-001BMS**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370739**
SampleType: **MS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370739**	Analysis Date: **05/18/2018**		Seq No: **8220762**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	111.5	5.0	100.0		111	90	110				S
Sulfate	1202	20	500.0	749.9	90.5	90	110				

Sample ID: **1805K45-001BMSD**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370739**
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**			BatchID: **R370739**	Analysis Date: **05/18/2018**		Seq No: **8220763**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	111.2	5.0	100.0		111	90	110	111.5	0.298	20	S
Sulfate	1194	20	500.0	749.9	88.9	90	110	1202	0.664	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: R370740

Sample ID: **MB-R370740**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370740**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370740**		Analysis Date: **05/18/2018**		Seq No: **8220767**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370740**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370740**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370740**		Analysis Date: **05/18/2018**		Seq No: **8220766**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.393	0.25	5.000		108	90	110				
Sulfate	26.03	1.0	25.00		104	90	110				

Sample ID: **1805K73-004BMS**	Client ID: **SW-2014-20**				Units: **mg/L**		Prep Date:		Run No: **370740**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370740**		Analysis Date: **05/18/2018**		Seq No: **8220777**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	66.75	2.5	50.00	4.874	124	90	110				S
Sulfate	444.3	10	250.0	201.4	97.2	90	110				

Sample ID: **1805K73-005BMS**	Client ID: **SW-2014-21**				Units: **mg/L**		Prep Date:		Run No: **370740**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370740**		Analysis Date: **05/18/2018**		Seq No: **8220779**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	66.34	2.5	50.00	4.708	123	90	110				S
Sulfate	444.1	10	250.0	192.7	101	90	110				

Sample ID: **1805K73-004BMSD**	Client ID: **SW-2014-20**				Units: **mg/L**		Prep Date:		Run No: **370740**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370740**		Analysis Date: **05/18/2018**		Seq No: **8220778**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	67.16	2.5	50.00	4.874	125	90	110	66.75	0.614	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805K73

ANALYTICAL QC SUMMARY REPORT

BatchID: R370740

Sample ID: **1805K73-004BMSD** Client ID: **SW-2014-20** Units: **mg/L** Prep Date: Run No: **370740**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R370740** Analysis Date: **05/18/2018** Seq No: **8220778**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	450.1	10	250.0	201.4	99.5	90	110	444.3	1.30	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

June 26, 2018

Rhonda Quinn
Wood Environment & Infrastructure
1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805882

Analytical Environmental Services, Inc. received 4 samples on 5/8/2018 5:40:00 PM
for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar
Project Manager

Revision 6/26/2018

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1805882

Date: 5/8/18 Page 1 of 1

COMPANY: Wood E&IS

ADDRESS: 1075 Big Shanty Rd Ste 100 Kennesaw, GA 30144

PHONE: 770-421-3400

EMAIL:

SAMPLED BY: D Howard, E Guillen, B Rhiner

SIGNATURE: Daniel Howard

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	** Tot Metals 6020	** Diss Metals 6020	Pest 8081A	VOC 8260	Nitrate as Sulfate 9056	REMARKS	Number of Containers
							PRESERVATION (see codes)						
							N	I	I	#F	I		
1	TripBlank-01	5/8/18	1000	X		W				X			2
2	EB-01		1220	X		W	X		X	X	X		6
3	MW-102		1215	X		GW	X	X	X	X	X		7
4	MW-1B		1552	X		GW	X	X	X	X	X		7
5	Temp Blank												
6													
7													
8													
9													
10													
11													
12													
13													
14													

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
Daniel Howard	5/8/18 1655	1.	5/8/18
2.	5/8/18 5:40	2.	5/8/18 5:40
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:
Lab will Filter dissolved metals
* Metals = As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail (courier) Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: BFEL Atlanta
PROJECT #: 612208015428
SITE ADDRESS: 1525 Pine St Atlanta, GA
SEND REPORT TO: Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ● III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: Wood Environment & Infrastructure
Project: BFEL Atlanta
Lab ID: 1805882

Case Narrative

Metals Analysis by Method 6020B:

Due to sample matrix, samples 1805882-003B and -004B required dilution during preparation and/or analysis resulting in elevated reporting limits for Copper.

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	TRIP BLANK-01
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 10:00:00 AM
Lab ID:	1805882-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 17:51	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 17:51	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 17:51	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 17:51	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 17:51	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 17:51	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 17:51	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 17:51	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 17:51	OM
Surr: 4-Bromofluorobenzene	95	68-127		%REC	260639	1	05/11/2018 17:51	OM
Surr: Dibromofluoromethane	106	84.4-122		%REC	260639	1	05/11/2018 17:51	OM
Surr: Toluene-d8	100	80.1-116		%REC	260639	1	05/11/2018 17:51	OM

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	EB-01
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 12:20:00 PM
Lab ID:	1805882-002	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/14/2018 20:02	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/14/2018 20:02	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/14/2018 20:02	OM
Acetone	BRL	0.050		mg/L	260639	1	05/14/2018 20:02	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/14/2018 20:02	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 18:17	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Methylene chloride	0.0071	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 18:17	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/14/2018 20:02	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/14/2018 20:02	OM
Surr: 4-Bromofluorobenzene	89.2	68-127		%REC	260639	1	05/14/2018 20:02	OM
Surr: Dibromofluoromethane	101	84.4-122		%REC	260639	1	05/14/2018 20:02	OM
Surr: Toluene-d8	102	80.1-116		%REC	260639	1	05/14/2018 20:02	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	EB-01
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 12:20:00 PM
Lab ID:	1805882-002	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 18:51	NG
Copper	0.00434	0.00200		mg/L	260929	1	05/22/2018 19:36	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 18:51	NG
Zinc	0.0235	0.0100		mg/L	260929	1	05/21/2018 18:51	NG
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R369952	1	05/09/2018 11:56	MP
Sulfate	BRL	1.0		mg/L	R369952	1	05/09/2018 11:56	MP
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 19:26	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 19:26	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 19:26	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 19:26	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 19:26	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 19:26	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 19:26	UH
Surr: Decachlorobiphenyl	94.2	15.4-120		%REC	260477	1	05/11/2018 19:26	UH
Surr: Tetrachloro-m-xylene	92.2	37-126		%REC	260477	1	05/11/2018 19:26	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-102
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 12:15:00 PM
Lab ID:	1805882-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 18:42	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 18:42	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 18:42	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 18:42	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 18:42	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 18:42	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 18:42	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 18:42	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 18:42	OM
Surr: 4-Bromofluorobenzene	94.3	68-127		%REC	260639	1	05/11/2018 18:42	OM
Surr: Dibromofluoromethane	110	84.4-122		%REC	260639	1	05/11/2018 18:42	OM
Surr: Toluene-d8	101	80.1-116		%REC	260639	1	05/11/2018 18:42	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-102
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 12:15:00 PM
Lab ID:	1805882-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:19	NG
Copper	BRL	0.0100		mg/L	260929	5	05/22/2018 19:43	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 20:19	NG
Zinc	0.161	0.0500		mg/L	260929	5	05/22/2018 19:43	NG
ION SCAN SW9056A								
Nitrate	3.1	0.25		mg/L	R369952	1	05/09/2018 12:11	MP
Sulfate	240	10		mg/L	R369952	10	05/09/2018 12:43	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/15/2018 23:10	NG
Copper	0.00627	0.00200		mg/L	260691	1	05/15/2018 23:10	NG
Lead	BRL	0.00100		mg/L	260691	1	05/15/2018 23:10	NG
Zinc	0.158	0.0100		mg/L	260691	1	05/15/2018 23:10	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 19:59	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 19:59	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 19:59	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 19:59	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 19:59	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 19:59	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 19:59	UH
Surr: Decachlorobiphenyl	77.1	15.4-120		%REC	260477	1	05/11/2018 19:59	UH
Surr: Tetrachloro-m-xylene	86.5	37-126		%REC	260477	1	05/11/2018 19:59	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-1B
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 3:52:00 PM
Lab ID:	1805882-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,1,2-Trichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,1-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,1-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,1-Dichloropropene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,2-Dichloroethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,2-Dichloropropane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
1,4-Dioxane	BRL	0.15		mg/L	260639	1	05/11/2018 19:09	OM
2-Butanone	BRL	0.050		mg/L	260639	1	05/11/2018 19:09	OM
4-Methyl-2-pentanone	BRL	0.010		mg/L	260639	1	05/11/2018 19:09	OM
Acetone	BRL	0.050		mg/L	260639	1	05/11/2018 19:09	OM
Benzene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Carbon disulfide	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Carbon tetrachloride	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Chlorobenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Chloroethane	BRL	0.010		mg/L	260639	1	05/11/2018 19:09	OM
Chloroform	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Chloromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Cyclohexane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Ethylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Isobutyl Alcohol	BRL	0.20		mg/L	260639	1	05/11/2018 19:09	OM
Isopropylbenzene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Methylene chloride	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Naphthalene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Styrene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Tetrachloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Tetrahydrofuran	BRL	0.010		mg/L	260639	1	05/11/2018 19:09	OM
Toluene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Trichloroethene	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Trichlorofluoromethane	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Vinyl chloride	BRL	0.0020		mg/L	260639	1	05/11/2018 19:09	OM
Xylenes, Total	BRL	0.0050		mg/L	260639	1	05/11/2018 19:09	OM
Surr: 4-Bromofluorobenzene	94.5	68-127		%REC	260639	1	05/11/2018 19:09	OM
Surr: Dibromofluoromethane	108	84.4-122		%REC	260639	1	05/11/2018 19:09	OM
Surr: Toluene-d8	103	80.1-116		%REC	260639	1	05/11/2018 19:09	OM
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 26-Jun-18

Client:	Wood Environment & Infrastructure	**Client Sample ID:**	MW-1B
Project Name:	BFEL Atlanta	**Collection Date:**	5/8/2018 3:52:00 PM
Lab ID:	1805882-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260929	1	05/21/2018 20:26	NG
Copper	BRL	0.0100		mg/L	260929	5	05/22/2018 19:49	NG
Lead	BRL	0.00100		mg/L	260929	1	05/21/2018 20:26	NG
Zinc	0.0146	0.0100		mg/L	260929	1	05/21/2018 20:26	NG
ION SCAN SW9056A								
Nitrate	6.8	0.25		mg/L	R369952	1	05/09/2018 12:26	MP
Sulfate	28	1.0		mg/L	R369952	1	05/09/2018 12:26	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260691	1	05/15/2018 23:41	NG
Copper	0.00414	0.00200		mg/L	260691	1	05/15/2018 23:41	NG
Lead	BRL	0.00100		mg/L	260691	1	05/15/2018 23:41	NG
Zinc	0.0157	0.0100		mg/L	260691	1	05/15/2018 23:41	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260477	1	05/11/2018 20:11	UH
4,4´-DDE	BRL	0.00010		mg/L	260477	1	05/11/2018 20:11	UH
4,4´-DDT	BRL	0.00010		mg/L	260477	1	05/11/2018 20:11	UH
alpha-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
alpha-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
beta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
delta-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
Dieldrin	BRL	0.00010		mg/L	260477	1	05/11/2018 20:11	UH
gamma-BHC	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
gamma-Chlordane	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
Heptachlor	BRL	0.000050		mg/L	260477	1	05/11/2018 20:11	UH
Methoxychlor	BRL	0.00050		mg/L	260477	1	05/11/2018 20:11	UH
Toxaphene	BRL	0.0030		mg/L	260477	1	05/11/2018 20:11	UH
Surr: Decachlorobiphenyl	80.9	15.4-120		%REC	260477	1	05/11/2018 20:11	UH
Surr: Tetrachloro-m-xylene	88.2	37-126		%REC	260477	1	05/11/2018 20:11	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 26-Jun-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: EB-01				**Lab ID:** 1805882-002			
Collection Date: 5/8/2018 12:20:00 PM				**Matrix:** Aqueous			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Methylene chloride	0.0071		0.0012	0.0050	mg/L	260639	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00434		0.00186	0.00200	mg/L	260929	1
Zinc	0.0235		0.00168	0.0100	mg/L	260929	1
Client Sample ID: MW-102				**Lab ID:** 1805882-003			
Collection Date: 5/8/2018 12:15:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.161		0.00840	0.0500	mg/L	260929	5
ION SCAN SW9056A							
Nitrate	3.1		0.055	0.25	mg/L	R369952	1
Sulfate	240		1.2	10	mg/L	R369952	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00627		0.00186	0.00200	mg/L	260691	1
Zinc	0.158		0.00168	0.0100	mg/L	260691	1
Client Sample ID: MW-1B				**Lab ID:** 1805882-004			
Collection Date: 5/8/2018 3:52:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Zinc	0.0146		0.00168	0.0100	mg/L	260929	1
ION SCAN SW9056A							
Nitrate	6.8		0.055	0.25	mg/L	R369952	1
Sulfate	28		0.12	1.0	mg/L	R369952	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00414		0.00186	0.00200	mg/L	260691	1
Zinc	0.0157		0.00168	0.0100	mg/L	260691	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear | Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Locked

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Lab Order: 1805882

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805882-001A	TRIP BLANK-01	5/8/2018 10:00:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805882-002A	EB-01	5/8/2018 12:20:00PM	Aqueous	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805882-002A	EB-01	5/8/2018 12:20:00PM	Aqueous	Volatile Organic Compounds by GC/MS		5/14/2018 4:17:00PM	05/14/2018
1805882-002B	EB-01	5/8/2018 12:20:00PM	Aqueous	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805882-002B	EB-01	5/8/2018 12:20:00PM	Aqueous	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805882-002C	EB-01	5/8/2018 12:20:00PM	Aqueous	APPENDIX II CHLORINATED PESTICIDE		5/10/2018 9:00:00AM	05/11/2018
1805882-002C	EB-01	5/8/2018 12:20:00PM	Aqueous	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805882-002D	EB-01	5/8/2018 12:20:00PM	Aqueous	ION SCAN			05/09/2018
1805882-003A	MW-102	5/8/2018 12:15:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805882-003B	MW-102	5/8/2018 12:15:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805882-003B	MW-102	5/8/2018 12:15:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805882-003C	MW-102	5/8/2018 12:15:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/15/2018
1805882-003D	MW-102	5/8/2018 12:15:00PM	Groundwater	ION SCAN			05/09/2018
1805882-003E	MW-102	5/8/2018 12:15:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018
1805882-004A	MW-1B	5/8/2018 3:52:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/11/2018 4:17:00PM	05/11/2018
1805882-004B	MW-1B	5/8/2018 3:52:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/21/2018
1805882-004B	MW-1B	5/8/2018 3:52:00PM	Groundwater	Total Metals by ICP/MS		5/18/2018 10:16:00AM	05/22/2018
1805882-004C	MW-1B	5/8/2018 3:52:00PM	Groundwater	Dissolved Metals by ICP/MS		5/15/2018 12:05:00PM	05/15/2018
1805882-004D	MW-1B	5/8/2018 3:52:00PM	Groundwater	ION SCAN			05/09/2018
1805882-004E	MW-1B	5/8/2018 3:52:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/10/2018 9:00:00AM	05/11/2018

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260477

Sample ID: **MB-260477** Client ID: Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204247**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000398	0	0.0005		79.6	15.4	120				
Surr: Tetrachloro-m-xylene	0.000473	0	0.0005		94.6	37	126				

Sample ID: **LCS-260477** Client ID: Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204248**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000970	0.00010	0.0010		97.0	61.9	135				
Dieldrin	0.001066	0.00010	0.0010		107	70.3	126				
gamma-BHC	0.001121	0.000050	0.0010		112	70.9	129				
Heptachlor	0.000989	0.000050	0.0010		98.9	63.5	128				
Surr: Decachlorobiphenyl	0.000459	0	0.0005		91.8	15.4	120				
Surr: Tetrachloro-m-xylene	0.000515	0	0.0005		103	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260477

Sample ID: **1805882-002CMS** Client ID: **EB-01** Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **MS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204250**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000836	0.00010	0.0010		83.6	43.2	136				
Dieldrin	0.000918	0.00010	0.0010		91.8	44	139				
gamma-BHC	0.000859	0.000050	0.0010		85.9	53.8	141				
Heptachlor	0.000779	0.000050	0.0010		77.9	34.3	144				
Surr: Decachlorobiphenyl	0.000419	0	0.0005		83.7	15.4	120				
Surr: Tetrachloro-m-xylene	0.000401	0	0.0005		80.2	37	126				

Sample ID: **1805882-002CMSD** Client ID: **EB-01** Units: **mg/L** Prep Date: **05/10/2018** Run No: **370174**
SampleType: **MSD** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260477** Analysis Date: **05/11/2018** Seq No: **8204251**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000964	0.00010	0.0010		96.3	43.2	136	0.0008362	14.1	21.1	
Dieldrin	0.001045	0.00010	0.0010		104	44	139	0.0009178	12.9	20	
gamma-BHC	0.000990	0.000050	0.0010		99.0	53.8	141	0.0008592	14.1	20	
Heptachlor	0.000891	0.000050	0.0010		89.1	34.3	144	0.0007790	13.4	24.4	
Surr: Decachlorobiphenyl	0.000455	0	0.0005		91.0	15.4	120	0.0004186	0	0	
Surr: Tetrachloro-m-xylene	0.000438	0	0.0005		87.7	37	126	0.0004008	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260639

Sample ID: **MB-260639** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/11/2018** Seq No: **8206112**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isobutyl Alcohol	BRL	0.20									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260639

Sample ID: **MB-260639** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/11/2018** Seq No: **8206112**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Styrene	BRL	0.0050									
Tetrachloroethene	BRL	0.0050									
Tetrahydrofuran	BRL	0.010									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04691	0	0.0500		93.8	68	127				
Surr: Dibromofluoromethane	0.05347	0	0.0500		107	84.4	122				
Surr: Toluene-d8	0.05011	0	0.0500		100	80.1	116				

Sample ID: **LCS-260639** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/11/2018** Seq No: **8206111**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.06076	0.0050	0.0500		122	69	136				
Benzene	0.04856	0.0050	0.0500		97.1	73.7	126				
Chlorobenzene	0.04788	0.0050	0.0500		95.8	73.5	124				
Toluene	0.05063	0.0050	0.0500		101	76.8	125				
Trichloroethene	0.04947	0.0050	0.0500		98.9	70.9	124				
Surr: 4-Bromofluorobenzene	0.04881	0	0.0500		97.6	68	127				
Surr: Dibromofluoromethane	0.05039	0	0.0500		101	84.4	122				
Surr: Toluene-d8	0.04941	0	0.0500		98.8	80.1	116				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260639

Sample ID: **1805A43-007AMS** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/12/2018** Seq No: **8206142**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	59.73	5.0	50.00		119	65.7	143				
Benzene	52.83	5.0	50.00		106	66.1	137				
Chlorobenzene	50.73	5.0	50.00		101	70.9	132				
Toluene	118.0	5.0	50.00	57.17	122	63.8	141				
Trichloroethene	53.30	5.0	50.00		107	70.6	128				
Surr: 4-Bromofluorobenzene	48.93	0	50.00		97.9	68	127				
Surr: Dibromofluoromethane	50.73	0	50.00		101	84.4	122				
Surr: Toluene-d8	50.71	0	50.00		101	80.1	116				

Sample ID: **1805A43-007AMSD** Client ID: Units: **mg/L** Prep Date: **05/11/2018** Run No: **370185**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **260639** Analysis Date: **05/12/2018** Seq No: **8206150**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	54.66	5.0	50.00		109	65.7	143	59.73	8.86	17.7	
Benzene	51.55	5.0	50.00		103	66.1	137	52.83	2.45	20	
Chlorobenzene	49.78	5.0	50.00		99.6	70.9	132	50.73	1.89	20	
Toluene	110.9	5.0	50.00	57.17	107	63.8	141	118.0	6.16	20	
Trichloroethene	52.01	5.0	50.00		104	70.6	128	53.30	2.45	20	
Surr: 4-Bromofluorobenzene	49.14	0	50.00		98.3	68	127	48.93	0	0	
Surr: Dibromofluoromethane	49.66	0	50.00		99.3	84.4	122	50.73	0	0	
Surr: Toluene-d8	50.93	0	50.00		102	80.1	116	50.71	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **MB-260691** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MBLK** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212028**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260691** Client ID: Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **LCS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212029**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1040	0.00500	0.1000		104	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09671	0.00100	0.1000		96.7	80	120				
Zinc	0.1101	0.0100	0.1000	0.008288	102	80	120				

Sample ID: **1805882-003CMS** Client ID: **MW-102** Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MS** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212031**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1012	0.00500	0.1000		101	75	125				
Copper	0.1031	0.00200	0.1000	0.006266	96.9	75	125				
Lead	0.09112	0.00100	0.1000	0.0006851	90.4	75	125				
Zinc	0.2435	0.0100	0.1000	0.1583	85.2	75	125				

Sample ID: **1805882-003CMSD** Client ID: **MW-102** Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1042	0.00500	0.1000		104	75	125	0.1012	2.92	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260691

Sample ID: **1805882-003CMSD** Client ID: **MW-102** Units: **mg/L** Prep Date: **05/15/2018** Run No: **370434**
SampleType: **MSD** TestCode: **Dissolved Metals by ICP/MS SW6020B** BatchID: **260691** Analysis Date: **05/15/2018** Seq No: **8212032**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1104	0.00200	0.1000	0.006266	104	75	125	0.1031	6.80	20	
Lead	0.09607	0.00100	0.1000	0.0006851	95.4	75	125	0.09112	5.29	20	
Zinc	0.2561	0.0100	0.1000	0.1583	97.9	75	125	0.2435	5.05	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260929

Sample ID: **MB-260929**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370896**
SampleType: **MBLK**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260929**	Analysis Date: **05/21/2018**	Seq No: **8224679**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260929**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370896**
SampleType: **LCS**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260929**	Analysis Date: **05/21/2018**	Seq No: **8224680**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1060	0.00500	0.1000		106	80	120				
Copper	0.1041	0.00200	0.1000		104	80	120				
Lead	0.1067	0.00100	0.1000		107	80	120				
Zinc	0.09607	0.0100	0.1000		96.1	80	120				

Sample ID: **1805882-002BMS**	Client ID: **EB-01**			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370896**
SampleType: **MS**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260929**	Analysis Date: **05/21/2018**	Seq No: **8224682**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1026	0.00500	0.1000		103	75	125				
Copper	0.1144	0.00200	0.1000	0.004388	110	75	125				
Lead	0.1067	0.00100	0.1000		107	75	125				
Zinc	0.1168	0.0100	0.1000	0.02348	93.3	75	125				

Sample ID: **1805882-002BMSD**	Client ID: **EB-01**			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370896**
SampleType: **MSD**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260929**	Analysis Date: **05/21/2018**	Seq No: **8224683**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1057	0.00500	0.1000		106	75	125	0.1026	2.97	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: 260929

Sample ID: **1805882-002BMSD** Client ID: **EB-01** Units: **mg/L** Prep Date: **05/18/2018** Run No: **370896**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260929** Analysis Date: **05/21/2018** Seq No: **8224683**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1121	0.00200	0.1000	0.004388	108	75	125	0.1144	2.01	20	
Lead	0.1112	0.00100	0.1000		111	75	125	0.1067	4.19	20	
Zinc	0.1151	0.0100	0.1000	0.02348	91.6	75	125	0.1168	1.48	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: R369952

Sample ID: **MB-R369952**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **369952**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R369952**		Analysis Date: **05/09/2018**		Seq No: **8198260**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R369952**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **369952**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R369952**		Analysis Date: **05/09/2018**		Seq No: **8198259**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.477	0.25	5.000		110	90	110				
Sulfate	26.18	1.0	25.00		105	90	110				

Sample ID: **1805882-002DMS**	Client ID: **EB-01**				Units: **mg/L**		Prep Date:		Run No: **369952**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R369952**		Analysis Date: **05/09/2018**		Seq No: **8198269**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.301	0.25	5.000		106	90	110				
Sulfate	25.40	1.0	25.00	0.3505	100	90	110				

Sample ID: **1805952-002BMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **369952**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R369952**		Analysis Date: **05/09/2018**		Seq No: **8198272**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	60.20	2.5	50.00	3.688	113	90	110				S
Sulfate	290.8	10	250.0	34.97	102	90	110				

Sample ID: **1805882-002DMSD**	Client ID: **EB-01**				Units: **mg/L**		Prep Date:		Run No: **369952**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R369952**		Analysis Date: **05/09/2018**		Seq No: **8198270**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.318	0.25	5.000		106	90	110	5.301	0.324	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Wood Environment & Infrastructure
Project Name: BFEL Atlanta
Workorder: 1805882

ANALYTICAL QC SUMMARY REPORT

BatchID: R369952

Sample ID: **1805882-002DMSD** Client ID: **EB-01** Units: **mg/L** Prep Date: Run No: **369952**
SampleType: **MSD** TestCode: **ION SCAN SW9056A** BatchID: **R369952** Analysis Date: **05/09/2018** Seq No: **8198270**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	25.39	1.0	25.00	0.3505	100	90	110	25.40	0.036	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

May 29, 2018

Rhonda Quinn
AMEC Foster Wheeler

1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL Atlanta

Dear Rhonda Quinn: Order No: 1805954

Analytical Environmental Services, Inc. received 11 samples on 5/15/2018 5:15:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar

Project Manager

Work Order: 1805954

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Date: 5/15/18 Page 1 of 1

COMPANY:	ADDRESS:
Wood E&IS	1075 Big Shanty Rd, Ste 100 Kennesaw, GA 30144
PHONE: 770-421-3400	EMAIL:
SAMPLED BY: D Howard, E Guillen, B Rhiner	SIGNATURE: Daniel L Howard

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	PRESERVATION (see codes) #	N	I	I	I	REMARKS	Number of Containers
1	Trip Blank-06	5/15/18	0930	X		W	2						2
2	TW-3		1116	X		GW	2	1	1	2	1		7
3	TW-4		1318	X		GW	2	1	1	2	1		7
4	TW-5		1336	X		GW	2	1	1	2	1		7
5	MW-22		1104	X		GW	2	1	1	2	1		7
6	OW-2		1351	X		GW	2	1	1	2	1		7
7	OW-3		1547	X		GW	2	1	1	2	1		7
8	MW-111		1110	X		GW	2	1	1	2	1	1	7
9	MW-109		1305	X		GW	2	1	1	2	1	1	7
10	MW-119		1620	X		GW	2	1	1	2	1	1	7
11	Temp Blank												
12													
13													
14													

ANALYSIS REQUESTED (* *)
- VOC 8260
- TAL Metals 6020
- Dissolved Metals 6020
- Pest 8081A
- Nitrate Sulfate 9056

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1. Daniel L Howard	5/15/18/1652	1.	5/15/18 4:52
2.	5/15/18 5:15	2.	5/15/18 5:15p
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:
Lab will filter dissolved metals
*Metals: As, Pb, Cu, Zn

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail (courier) Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: BFEL Atlanta
PROJECT #: 612208015A.28
SITE ADDRESS: 1525 Pine St Atlanta, GA
SEND REPORT TO: Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers

Turnaround Time (TAT) Request
- [X] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? [ ] Fax? [ ]
DATA PACKAGE: I ○ II ● III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: AMEC Foster Wheeler
Project: BFEL Atlanta
Lab ID: 1805954

Case Narrative

Sample Receiving Non-conformance:

Sample DUP-4 was received but not listed on the Chain of Custody. At the request of Daniel Howard with Wood PLC via phone on 5/16/18, sample was analyzed for Total and Dissolved Metals as the rest of the samples received.

Analytical Environmental Services, Inc

Date: 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TRIP BLANK-06
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 9:30:00 AM
Lab ID:	1805954-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 15:08	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 15:08	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 15:08	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 15:08	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Chlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 15:08	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 15:08	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 15:08	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 15:08	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 15:08	NP
Surr: 4-Bromofluorobenzene	94.6	68-127		%REC	261105	1	05/23/2018 15:08	NP
Surr: Dibromofluoromethane	94.8	84.4-122		%REC	261105	1	05/23/2018 15:08	NP
Surr: Toluene-d8	103	80.1-116		%REC	261105	1	05/23/2018 15:08	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-3
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 11:16:00 AM
Lab ID:	1805954-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 01:36	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 01:36	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 01:36	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 01:36	NP
Benzene	0.013	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Chlorobenzene	0.020	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 01:36	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
cis-1,2-Dichloroethene	0.13	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 01:36	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 01:36	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 01:36	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 01:36	NP
Surr: 4-Bromofluorobenzene	96.2	68-127		%REC	261105	1	05/23/2018 01:36	NP
Surr: Dibromofluoromethane	97.6	84.4-122		%REC	261105	1	05/23/2018 01:36	NP
Surr: Toluene-d8	99.4	80.1-116		%REC	261105	1	05/23/2018 01:36	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-3
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 11:16:00 AM
Lab ID:	1805954-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 03:11	NG
Copper	0.652	0.00200		mg/L	260895	1	05/19/2018 03:11	NG
Lead	0.00245	0.00100		mg/L	260895	1	05/19/2018 03:11	NG
Zinc	1.76	0.0100		mg/L	260895	1	05/19/2018 03:11	NG
ION SCAN SW9056A								
Nitrate	1.8	0.25		mg/L	R370552	1	05/16/2018 12:11	MP
Sulfate	590	10		mg/L	R370552	10	05/16/2018 13:27	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 08:06	NG
Copper	0.663	0.00200		mg/L	260890	1	05/19/2018 08:06	NG
Lead	0.00219	0.00100		mg/L	260890	1	05/19/2018 08:06	NG
Zinc	1.85	0.0100		mg/L	260890	1	05/19/2018 08:06	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 12:58	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 12:58	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 12:58	UH
alpha-BHC	0.0017	0.00010		mg/L	260772	2	05/17/2018 17:47	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 12:58	UH
beta-BHC	0.0014	0.000050		mg/L	260772	1	05/17/2018 12:58	UH
delta-BHC	0.00043	0.000050		mg/L	260772	1	05/17/2018 12:58	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 12:58	UH
gamma-BHC	0.00067	0.000050		mg/L	260772	1	05/17/2018 12:58	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 12:58	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 12:58	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 12:58	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 12:58	UH
Surr: Decachlorobiphenyl	83.1	15.4-120		%REC	260772	1	05/17/2018 12:58	UH
Surr: Tetrachloro-m-xylene	74.3	37-126		%REC	260772	1	05/17/2018 12:58	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-4
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 1:18:00 PM
Lab ID:	1805954-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 02:29	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 02:29	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 02:29	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 02:29	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Chlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 02:29	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 02:29	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 02:29	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 02:29	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 02:29	NP
Surr: 4-Bromofluorobenzene	97.7	68-127		%REC	261105	1	05/23/2018 02:29	NP
Surr: Dibromofluoromethane	98	84.4-122		%REC	261105	1	05/23/2018 02:29	NP
Surr: Toluene-d8	101	80.1-116		%REC	261105	1	05/23/2018 02:29	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-4
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 1:18:00 PM
Lab ID:	1805954-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 03:42	NG
Copper	0.146	0.00200		mg/L	260895	1	05/19/2018 03:42	NG
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 03:42	NG
Zinc	0.719	0.0100		mg/L	260895	1	05/19/2018 03:42	NG
ION SCAN SW9056A								
Nitrate	2.3	0.25		mg/L	R370552	1	05/16/2018 12:26	MP
Sulfate	130	10		mg/L	R370552	10	05/16/2018 13:42	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 08:12	NG
Copper	0.166	0.00200		mg/L	260890	1	05/19/2018 08:12	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 08:12	NG
Zinc	0.867	0.0100		mg/L	260890	1	05/19/2018 08:12	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 13:31	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 13:31	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 13:31	UH
alpha-BHC	BRL	0.000050		mg/L	260772	1	05/17/2018 13:31	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 13:31	UH
beta-BHC	0.0028	0.00010		mg/L	260772	2	05/17/2018 18:21	UH
delta-BHC	BRL	0.000050		mg/L	260772	1	05/17/2018 13:31	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 13:31	UH
gamma-BHC	BRL	0.000050		mg/L	260772	1	05/17/2018 13:31	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 13:31	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 13:31	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 13:31	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 13:31	UH
Surr: Decachlorobiphenyl	53.6	15.4-120		%REC	260772	1	05/17/2018 13:31	UH
Surr: Tetrachloro-m-xylene	67.6	37-126		%REC	260772	1	05/17/2018 13:31	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-5
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 3:36:00 PM
Lab ID:	1805954-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 02:55	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 02:55	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 02:55	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 02:55	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Chlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 02:55	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 02:55	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 02:55	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 02:55	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 02:55	NP
Surr: 4-Bromofluorobenzene	98.3	68-127		%REC	261105	1	05/23/2018 02:55	NP
Surr: Dibromofluoromethane	96.1	84.4-122		%REC	261105	1	05/23/2018 02:55	NP
Surr: Toluene-d8	102	80.1-116		%REC	261105	1	05/23/2018 02:55	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	TW-5
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 3:36:00 PM
Lab ID:	1805954-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 03:48	NG
Copper	1.04	0.00200		mg/L	260895	1	05/19/2018 03:48	NG
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 03:48	NG
Zinc	15.8	0.500		mg/L	260895	50	05/24/2018 16:02	DP
ION SCAN SW9056A								
Nitrate	26	2.5		mg/L	R370552	10	05/16/2018 13:57	MP
Sulfate	530	10		mg/L	R370552	10	05/16/2018 13:57	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 08:19	NG
Copper	1.18	0.00200		mg/L	260890	1	05/19/2018 08:19	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 08:19	NG
Zinc	14.5	0.500		mg/L	260890	50	05/25/2018 10:43	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 13:43	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 13:43	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 13:43	UH
alpha-BHC	0.000078	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
beta-BHC	0.00060	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
delta-BHC	BRL	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 13:43	UH
gamma-BHC	0.00011	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 13:43	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 13:43	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 13:43	UH
Surr: Decachlorobiphenyl	68.8	15.4-120		%REC	260772	1	05/17/2018 13:43	UH
Surr: Tetrachloro-m-xylene	76.3	37-126		%REC	260772	1	05/17/2018 13:43	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-22
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 11:04:00 AM
Lab ID:	1805954-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/22/2018 23:52	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/22/2018 23:52	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/22/2018 23:52	NP
Acetone	BRL	0.050		mg/L	261105	1	05/22/2018 23:52	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Chlorobenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/22/2018 23:52	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
cis-1,2-Dichloroethene	0.0072	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/22/2018 23:52	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/22/2018 23:52	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/22/2018 23:52	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/22/2018 23:52	NP
Surr: 4-Bromofluorobenzene	99.3	68-127		%REC	261105	1	05/22/2018 23:52	NP
Surr: Dibromofluoromethane	99.7	84.4-122		%REC	261105	1	05/22/2018 23:52	NP
Surr: Toluene-d8	98.8	80.1-116		%REC	261105	1	05/22/2018 23:52	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-22
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 11:04:00 AM
Lab ID:	1805954-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 03:55	NG
Copper	1.44	0.00200		mg/L	260895	1	05/19/2018 03:55	NG
Lead	0.00209	0.00100		mg/L	260895	1	05/19/2018 03:55	NG
Zinc	4.53	0.0100		mg/L	260895	1	05/19/2018 03:55	NG
ION SCAN SW9056A								
Nitrate	3.2	0.25		mg/L	R370552	1	05/16/2018 12:56	MP
Sulfate	450	10		mg/L	R370552	10	05/16/2018 14:12	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 08:25	NG
Copper	1.55	0.00200		mg/L	260890	1	05/19/2018 08:25	NG
Lead	0.00214	0.00100		mg/L	260890	1	05/19/2018 08:25	NG
Zinc	5.00	0.0100		mg/L	260890	1	05/19/2018 08:25	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 13:54	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 13:54	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 13:54	UH
alpha-BHC	0.00012	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
beta-BHC	0.00052	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
delta-BHC	0.000072	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 13:54	UH
gamma-BHC	0.00018	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 13:54	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 13:54	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 13:54	UH
Surr: Decachlorobiphenyl	64	15.4-120		%REC	260772	1	05/17/2018 13:54	UH
Surr: Tetrachloro-m-xylene	83.2	37-126		%REC	260772	1	05/17/2018 13:54	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	OW-2
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 1:51:00 PM
Lab ID:	1805954-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,2,4-Trichlorobenzene	0.0051	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 14:15	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 14:15	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 14:15	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 14:15	NP
Benzene	0.0099	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Chlorobenzene	0.30	0.050		mg/L	261105	10	05/23/2018 14:42	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 14:15	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 14:15	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 14:15	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 14:15	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 14:15	NP
Surr: 4-Bromofluorobenzene	95.8	68-127		%REC	261105	1	05/23/2018 14:15	NP
Surr: 4-Bromofluorobenzene	98.3	68-127		%REC	261105	10	05/23/2018 14:42	NP
Surr: Dibromofluoromethane	96	84.4-122		%REC	261105	1	05/23/2018 14:15	NP
Surr: Dibromofluoromethane	96.4	84.4-122		%REC	261105	10	05/23/2018 14:42	NP
Surr: Toluene-d8	101	80.1-116		%REC	261105	1	05/23/2018 14:15	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	OW-2
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 1:51:00 PM
Lab ID:	1805954-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
Surr: Toluene-d8	103	80.1-116		%REC	261105	10	05/23/2018 14:42	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.0501	0.00500		mg/L	260895	1	05/19/2018 04:20	NG
Copper	0.0441	0.0100		mg/L	260895	5	05/24/2018 16:06	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 04:20	NG
Zinc	3.79	0.0500		mg/L	260895	5	05/24/2018 16:06	DP
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370552	1	05/16/2018 13:11	MP
Sulfate	490	10		mg/L	R370552	10	05/16/2018 14:31	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	0.0123	0.00500		mg/L	260890	1	05/19/2018 08:31	NG
Copper	0.0204	0.00200		mg/L	260890	1	05/19/2018 08:31	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 08:31	NG
Zinc	2.95	0.0100		mg/L	260890	1	05/19/2018 08:31	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 14:05	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 14:05	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 14:05	UH
alpha-BHC	0.027	0.0012		mg/L	260772	25	05/17/2018 18:32	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:05	UH
beta-BHC	0.0054	0.0012		mg/L	260772	25	05/17/2018 18:32	UH
delta-BHC	0.072	0.0062		mg/L	260772	125	05/18/2018 13:41	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 14:05	UH
gamma-BHC	0.018	0.0012		mg/L	260772	25	05/17/2018 18:32	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:05	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 14:05	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 14:05	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 14:05	UH
Surr: Decachlorobiphenyl	63.6	15.4-120		%REC	260772	1	05/17/2018 14:05	UH
Surr: Tetrachloro-m-xylene	271	37-126	S	%REC	260772	1	05/17/2018 14:05	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	OW-3
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 3:47:00 PM
Lab ID:	1805954-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 03:21	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 03:21	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 03:21	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 03:21	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Chlorobenzene	0.015	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 03:21	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 03:21	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 03:21	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 03:21	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 03:21	NP
Surr: 4-Bromofluorobenzene	98	68-127		%REC	261105	1	05/23/2018 03:21	NP
Surr: Dibromofluoromethane	95.8	84.4-122		%REC	261105	1	05/23/2018 03:21	NP
Surr: Toluene-d8	99.5	80.1-116		%REC	261105	1	05/23/2018 03:21	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	OW-3
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 3:47:00 PM
Lab ID:	1805954-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 04:26	NG
Copper	0.572	0.00400		mg/L	260895	2	05/24/2018 16:08	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 04:26	NG
Zinc	5.01	0.0200		mg/L	260895	2	05/24/2018 16:08	DP
ION SCAN SW9056A								
Nitrate	0.58	0.25		mg/L	R370564	1	05/16/2018 13:16	MP
Sulfate	480	10		mg/L	R370564	10	05/16/2018 15:36	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 08:56	NG
Copper	0.486	0.00200		mg/L	260890	1	05/19/2018 08:56	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 08:56	NG
Zinc	4.12	0.0100		mg/L	260890	1	05/19/2018 08:56	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 14:16	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 14:16	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 14:16	UH
alpha-BHC	0.0038	0.00050		mg/L	260772	10	05/17/2018 18:43	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:16	UH
beta-BHC	0.0020	0.00050		mg/L	260772	10	05/17/2018 18:43	UH
delta-BHC	0.0097	0.00050		mg/L	260772	10	05/17/2018 18:43	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 14:16	UH
gamma-BHC	0.0020	0.00050		mg/L	260772	10	05/17/2018 18:43	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:16	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 14:16	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 14:16	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 14:16	UH
Surr: Decachlorobiphenyl	62.1	15.4-120		%REC	260772	1	05/17/2018 14:16	UH
Surr: Tetrachloro-m-xylene	61.9	37-126		%REC	260772	1	05/17/2018 14:16	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-111
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 11:10:00 AM
Lab ID:	1805954-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/22/2018 23:26	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/22/2018 23:26	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/22/2018 23:26	NP
Acetone	BRL	0.050		mg/L	261105	1	05/22/2018 23:26	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Chlorobenzene	0.096	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/22/2018 23:26	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/22/2018 23:26	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/22/2018 23:26	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/22/2018 23:26	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/22/2018 23:26	NP
Surr: 4-Bromofluorobenzene	97.5	68-127		%REC	261105	1	05/22/2018 23:26	NP
Surr: Dibromofluoromethane	97.1	84.4-122		%REC	261105	1	05/22/2018 23:26	NP
Surr: Toluene-d8	100	80.1-116		%REC	261105	1	05/22/2018 23:26	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-111
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 11:10:00 AM
Lab ID:	1805954-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 04:33	NG
Copper	0.0391	0.0200		mg/L	260895	10	05/24/2018 16:10	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 04:33	NG
Zinc	6.82	0.100		mg/L	260895	10	05/24/2018 16:10	DP
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370564	1	05/16/2018 13:31	MP
Sulfate	450	10		mg/L	R370564	10	05/16/2018 15:51	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 09:03	NG
Copper	0.0277	0.00200		mg/L	260890	1	05/19/2018 09:03	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 09:03	NG
Zinc	6.18	0.100		mg/L	260890	10	05/25/2018 11:07	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 14:28	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 14:28	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 14:28	UH
alpha-BHC	0.032	0.0012		mg/L	260772	25	05/17/2018 18:54	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:28	UH
beta-BHC	0.0067	0.0012		mg/L	260772	25	05/17/2018 18:54	UH
delta-BHC	0.054	0.0062		mg/L	260772	125	05/18/2018 13:52	UH
Dieldrin	0.00012	0.00010		mg/L	260772	1	05/17/2018 14:28	UH
gamma-BHC	0.036	0.0012		mg/L	260772	25	05/17/2018 18:54	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:28	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 14:28	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 14:28	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 14:28	UH
Surr: Decachlorobiphenyl	85.8	15.4-120		%REC	260772	1	05/17/2018 14:28	UH
Surr: Tetrachloro-m-xylene	94.4	37-126		%REC	260772	1	05/17/2018 14:28	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-109
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 1:05:00 PM
Lab ID:	1805954-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
1,4-Dioxane	BRL	0.15		mg/L	261105	1	05/23/2018 03:47	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 03:47	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 03:47	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 03:47	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Chlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 03:47	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 03:47	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 03:47	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 03:47	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 03:47	NP
Surr: 4-Bromofluorobenzene	98.1	68-127		%REC	261105	1	05/23/2018 03:47	NP
Surr: Dibromofluoromethane	98.7	84.4-122		%REC	261105	1	05/23/2018 03:47	NP
Surr: Toluene-d8	101	80.1-116		%REC	261105	1	05/23/2018 03:47	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-109
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 1:05:00 PM
Lab ID:	1805954-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.206	0.00500		mg/L	260895	1	05/19/2018 04:39	NG
Copper	0.0390	0.0200		mg/L	260895	10	05/24/2018 16:18	DP
Lead	0.453	0.00100		mg/L	260895	1	05/19/2018 04:39	NG
Zinc	21.9	0.100		mg/L	260895	10	05/24/2018 16:18	DP
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370564	1	05/16/2018 13:46	MP
Sulfate	1500	20		mg/L	R370564	20	05/16/2018 16:06	MP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.199	0.00500		mg/L	260890	1	05/19/2018 09:09	NG
Copper	0.0302	0.00200		mg/L	260890	1	05/19/2018 09:09	NG
Lead	0.00307	0.00100		mg/L	260890	1	05/19/2018 09:09	NG
Zinc	21.0	0.100		mg/L	260890	10	05/25/2018 11:09	DP
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3510C)**			
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 14:39	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 14:39	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 14:39	UH
alpha-BHC	0.045	0.0050		mg/L	260772	100	05/18/2018 14:03	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:39	UH
beta-BHC	0.0039	0.0010		mg/L	260772	20	05/17/2018 19:05	UH
delta-BHC	0.0037	0.0010		mg/L	260772	20	05/17/2018 19:05	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 14:39	UH
gamma-BHC	0.026	0.0010		mg/L	260772	20	05/17/2018 19:05	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:39	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 14:39	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 14:39	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 14:39	UH
Surr: Decachlorobiphenyl	61.8	15.4-120		%REC	260772	1	05/17/2018 14:39	UH
Surr: Tetrachloro-m-xylene	67.7	37-126		%REC	260772	1	05/17/2018 14:39	UH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-119
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 4:20:00 PM
Lab ID:	1805954-010	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,1,2,2-Tetrachloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,1,2-Trichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,1-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,1-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,1-Dichloropropene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,2,4-Trichlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,2-Dichloroethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,2-Dichloropropane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
1,4-Dioxane	0.75	0.15		mg/L	261105	1	05/23/2018 04:13	NP
2-Butanone	BRL	0.050		mg/L	261105	1	05/23/2018 04:13	NP
4-Methyl-2-pentanone	BRL	0.010		mg/L	261105	1	05/23/2018 04:13	NP
Acetone	BRL	0.050		mg/L	261105	1	05/23/2018 04:13	NP
Benzene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Carbon disulfide	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Carbon tetrachloride	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Chlorobenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Chloroethane	BRL	0.010		mg/L	261105	1	05/23/2018 04:13	NP
Chloroform	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Chloromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
cis-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Cyclohexane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Ethylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Isobutyl Alcohol	BRL	0.20		mg/L	261105	1	05/23/2018 04:13	NP
Isopropylbenzene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Methylene chloride	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Naphthalene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Styrene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Tetrachloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Tetrahydrofuran	BRL	0.010		mg/L	261105	1	05/23/2018 04:13	NP
Toluene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
trans-1,2-Dichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Trichloroethene	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Trichlorofluoromethane	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Vinyl chloride	BRL	0.0020		mg/L	261105	1	05/23/2018 04:13	NP
Xylenes, Total	BRL	0.0050		mg/L	261105	1	05/23/2018 04:13	NP
Surr: 4-Bromofluorobenzene	96.6	68-127		%REC	261105	1	05/23/2018 04:13	NP
Surr: Dibromofluoromethane	96.2	84.4-122		%REC	261105	1	05/23/2018 04:13	NP
Surr: Toluene-d8	102	80.1-116		%REC	261105	1	05/23/2018 04:13	NP
Total Metals by ICP/MS SW6020B				**(SW3005A)**				

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	MW-119
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 4:20:00 PM
Lab ID:	1805954-010	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260895	1	05/19/2018 04:45	NG
Copper	0.00421	0.00200		mg/L	260895	1	05/24/2018 16:20	DP
Lead	BRL	0.00100		mg/L	260895	1	05/19/2018 04:45	NG
Zinc	0.647	0.0100		mg/L	260895	1	05/24/2018 16:20	DP
ION SCAN SW9056A								
Nitrate	BRL	0.25		mg/L	R370564	1	05/16/2018 14:15	MP
Sulfate	59	1.0		mg/L	R370564	1	05/16/2018 14:15	MP
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	260890	1	05/19/2018 09:15	NG
Copper	0.00216	0.00200		mg/L	260890	1	05/19/2018 09:15	NG
Lead	BRL	0.00100		mg/L	260890	1	05/19/2018 09:15	NG
Zinc	0.483	0.0100		mg/L	260890	1	05/19/2018 09:15	NG
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	260772	1	05/17/2018 14:50	UH
4,4´-DDE	BRL	0.00010		mg/L	260772	1	05/17/2018 14:50	UH
4,4´-DDT	BRL	0.00010		mg/L	260772	1	05/17/2018 14:50	UH
alpha-BHC	0.00045	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
alpha-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
beta-BHC	0.00034	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
delta-BHC	0.00038	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
Dieldrin	BRL	0.00010		mg/L	260772	1	05/17/2018 14:50	UH
gamma-BHC	0.000053	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
gamma-Chlordane	BRL	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
Heptachlor	BRL	0.000050		mg/L	260772	1	05/17/2018 14:50	UH
Methoxychlor	BRL	0.00050		mg/L	260772	1	05/17/2018 14:50	UH
Toxaphene	BRL	0.0030		mg/L	260772	1	05/17/2018 14:50	UH
Surr: Decachlorobiphenyl	61.3	15.4-120		%REC	260772	1	05/17/2018 14:50	UH
Surr: Tetrachloro-m-xylene	59.9	37-126		%REC	260772	1	05/17/2018 14:50	UH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 29-May-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	DUP-4
Project Name:	BFEL Atlanta	**Collection Date:**	5/15/2018 12:00:00 PM
Lab ID:	1805954-011	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.191	0.00500		mg/L	260895	1	05/19/2018 04:51	NG
Copper	0.0472	0.0200		mg/L	260895	10	05/24/2018 16:22	DP
Lead	0.407	0.00100		mg/L	260895	1	05/19/2018 04:51	NG
Zinc	22.4	0.100		mg/L	260895	10	05/24/2018 16:22	DP
Dissolved Metals by ICP/MS SW6020B					**(SW3005A)**			
Arsenic	0.198	0.00500		mg/L	260890	1	05/19/2018 09:22	NG
Copper	0.0304	0.00200		mg/L	260890	1	05/19/2018 09:22	NG
Lead	0.00305	0.00100		mg/L	260890	1	05/19/2018 09:22	NG
Zinc	20.9	0.100		mg/L	260890	10	05/25/2018 11:18	DP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 29-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: TW-3				**Lab ID:** 1805954-002			
Collection Date: 5/15/2018 11:16:00 AM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Benzene	0.013		0.00037	0.0050	mg/L	261105	1
Chlorobenzene	0.020		0.00042	0.0050	mg/L	261105	1
cis-1,2-Dichloroethene	0.13		0.00028	0.0050	mg/L	261105	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.652		0.00186	0.00200	mg/L	260895	1
Lead	0.00245		0.000621	0.00100	mg/L	260895	1
Zinc	1.76		0.00168	0.0100	mg/L	260895	1
ION SCAN SW9056A							
Nitrate	1.8		0.055	0.25	mg/L	R370552	1
Sulfate	590		1.2	10	mg/L	R370552	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.663		0.00186	0.00200	mg/L	260890	1
Lead	0.00219		0.000621	0.00100	mg/L	260890	1
Zinc	1.85		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.0017		0.000036	0.00010	mg/L	260772	2
beta-BHC	0.0014		0.000015	0.000050	mg/L	260772	1
delta-BHC	0.00043		0.000014	0.000050	mg/L	260772	1
gamma-BHC	0.00067		0.000017	0.000050	mg/L	260772	1
Client Sample ID: TW-4				**Lab ID:** 1805954-003			
Collection Date: 5/15/2018 1:18:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.146		0.00186	0.00200	mg/L	260895	1
Zinc	0.719		0.00168	0.0100	mg/L	260895	1
ION SCAN SW9056A							
Nitrate	2.3		0.055	0.25	mg/L	R370552	1
Sulfate	130		1.2	10	mg/L	R370552	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.166		0.00186	0.00200	mg/L	260890	1
Zinc	0.867		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
beta-BHC	0.0028		0.000031	0.00010	mg/L	260772	2
Client Sample ID: TW-5				**Lab ID:** 1805954-004			
Collection Date: 5/15/2018 3:36:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.04		0.00186	0.00200	mg/L	260895	1
Zinc	15.8		0.0840	0.500	mg/L	260895	50
ION SCAN SW9056A							
Nitrate	26		0.55	2.5	mg/L	R370552	10
Sulfate	530		1.2	10	mg/L	R370552	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.18		0.00186	0.00200	mg/L	260890	1
Zinc	14.5		0.0840	0.500	mg/L	260890	50

Analytical Environmental Services, Inc

Date: 29-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: TW-5				**Lab ID:** 1805954-004			
Collection Date: 5/15/2018 3:36:00 PM				**Matrix:** Groundwater			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.000078		0.000018	0.000050	mg/L	260772	1
beta-BHC	0.00060		0.000015	0.000050	mg/L	260772	1
gamma-BHC	0.00011		0.000017	0.000050	mg/L	260772	1
Client Sample ID: MW-22				**Lab ID:** 1805954-005			
Collection Date: 5/15/2018 11:04:00 AM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
cis-1,2-Dichloroethene	0.0072		0.00028	0.0050	mg/L	261105	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.44		0.00186	0.00200	mg/L	260895	1
Lead	0.00209		0.000621	0.00100	mg/L	260895	1
Zinc	4.53		0.00168	0.0100	mg/L	260895	1
ION SCAN SW9056A							
Nitrate	3.2		0.055	0.25	mg/L	R370552	1
Sulfate	450		1.2	10	mg/L	R370552	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	1.55		0.00186	0.00200	mg/L	260890	1
Lead	0.00214		0.000621	0.00100	mg/L	260890	1
Zinc	5.00		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00012		0.000018	0.000050	mg/L	260772	1
beta-BHC	0.00052		0.000015	0.000050	mg/L	260772	1
delta-BHC	0.000072		0.000014	0.000050	mg/L	260772	1
gamma-BHC	0.00018		0.000017	0.000050	mg/L	260772	1
Client Sample ID: OW-2				**Lab ID:** 1805954-006			
Collection Date: 5/15/2018 1:51:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
1,2,4-Trichlorobenzene	0.0051		0.00039	0.0050	mg/L	261105	1
Benzene	0.0099		0.00037	0.0050	mg/L	261105	1
Chlorobenzene	0.30		0.0042	0.050	mg/L	261105	10
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0501		0.00205	0.00500	mg/L	260895	1
Copper	0.0441		0.00930	0.0100	mg/L	260895	5
Zinc	3.79		0.00840	0.0500	mg/L	260895	5
ION SCAN SW9056A							
Sulfate	490		1.2	10	mg/L	R370552	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.0123		0.00205	0.00500	mg/L	260890	1
Copper	0.0204		0.00186	0.00200	mg/L	260890	1
Zinc	2.95		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.027		0.00045	0.0012	mg/L	260772	25
beta-BHC	0.0054		0.00038	0.0012	mg/L	260772	25
delta-BHC	0.072		0.0017	0.0062	mg/L	260772	125

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: OW-2				**Lab ID:** 1805954-006			
Collection Date: 5/15/2018 1:51:00 PM				**Matrix:** Groundwater			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
gamma-BHC	0.018		0.00043	0.0012	mg/L	260772	25
Client Sample ID: OW-3				**Lab ID:** 1805954-007			
Collection Date: 5/15/2018 3:47:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Chlorobenzene	0.015		0.00042	0.0050	mg/L	261105	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.572		0.00372	0.00400	mg/L	260895	2
Zinc	5.01		0.00336	0.0200	mg/L	260895	2
ION SCAN SW9056A							
Nitrate	0.58		0.055	0.25	mg/L	R370564	1
Sulfate	480		1.2	10	mg/L	R370564	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.486		0.00186	0.00200	mg/L	260890	1
Zinc	4.12		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.0038		0.00018	0.00050	mg/L	260772	10
beta-BHC	0.0020		0.00015	0.00050	mg/L	260772	10
delta-BHC	0.0097		0.00014	0.00050	mg/L	260772	10
gamma-BHC	0.0020		0.00017	0.00050	mg/L	260772	10
Client Sample ID: MW-111				**Lab ID:** 1805954-008			
Collection Date: 5/15/2018 11:10:00 AM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
Chlorobenzene	0.096		0.00042	0.0050	mg/L	261105	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0391		0.0186	0.0200	mg/L	260895	10
Zinc	6.82		0.0168	0.100	mg/L	260895	10
ION SCAN SW9056A							
Sulfate	450		1.2	10	mg/L	R370564	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.0277		0.00186	0.00200	mg/L	260890	1
Zinc	6.18		0.0168	0.100	mg/L	260890	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.032		0.00045	0.0012	mg/L	260772	25
beta-BHC	0.0067		0.00038	0.0012	mg/L	260772	25
delta-BHC	0.054		0.0017	0.0062	mg/L	260772	125
Dieldrin	0.00012		0.000017	0.00010	mg/L	260772	1
gamma-BHC	0.036		0.00043	0.0012	mg/L	260772	25
Client Sample ID: MW-109				**Lab ID:** 1805954-009			
Collection Date: 5/15/2018 1:05:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.206		0.00205	0.00500	mg/L	260895	1
Copper	0.0390		0.0186	0.0200	mg/L	260895	10

Analytical Environmental Services, Inc

Date: 29-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-109				**Lab ID:** 1805954-009			
Collection Date: 5/15/2018 1:05:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Lead	0.453		0.000621	0.00100	mg/L	260895	1
Zinc	21.9		0.0168	0.100	mg/L	260895	10
ION SCAN SW9056A							
Sulfate	1500		2.3	20	mg/L	R370564	20
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.199		0.00205	0.00500	mg/L	260890	1
Copper	0.0302		0.00186	0.00200	mg/L	260890	1
Lead	0.00307		0.000621	0.00100	mg/L	260890	1
Zinc	21.0		0.0168	0.100	mg/L	260890	10
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.045		0.0018	0.0050	mg/L	260772	100
beta-BHC	0.0039		0.00031	0.0010	mg/L	260772	20
delta-BHC	0.0037		0.00027	0.0010	mg/L	260772	20
gamma-BHC	0.026		0.00035	0.0010	mg/L	260772	20
Client Sample ID: MW-119				**Lab ID:** 1805954-010			
Collection Date: 5/15/2018 4:20:00 PM				**Matrix:** Groundwater			
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**			
1,4-Dioxane	0.75		0.063	0.15	mg/L	261105	1
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00421		0.00186	0.00200	mg/L	260895	1
Zinc	0.647		0.00168	0.0100	mg/L	260895	1
ION SCAN SW9056A							
Sulfate	59		0.12	1.0	mg/L	R370564	1
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Copper	0.00216		0.00186	0.00200	mg/L	260890	1
Zinc	0.483		0.00168	0.0100	mg/L	260890	1
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**			
alpha-BHC	0.00045		0.000018	0.000050	mg/L	260772	1
beta-BHC	0.00034		0.000015	0.000050	mg/L	260772	1
delta-BHC	0.00038		0.000014	0.000050	mg/L	260772	1
gamma-BHC	0.000053		0.000017	0.000050	mg/L	260772	1
Client Sample ID: DUP-4				**Lab ID:** 1805954-011			
Collection Date: 5/15/2018 12:00:00 PM				**Matrix:** Groundwater			
Total Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.191		0.00205	0.00500	mg/L	260895	1
Copper	0.0472		0.0186	0.0200	mg/L	260895	10
Lead	0.407		0.000621	0.00100	mg/L	260895	1
Zinc	22.4		0.0168	0.100	mg/L	260895	10
Dissolved Metals by ICP/MS SW6020B				**(SW3005A)**			
Arsenic	0.198		0.00205	0.00500	mg/L	260890	1
Copper	0.0304		0.00186	0.00200	mg/L	260890	1
Lead	0.00305		0.000621	0.00100	mg/L	260890	1
Zinc	20.9		0.0168	0.100	mg/L	260890	10

Analytical Environmental Services, Inc

Date: 29-May-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Analytical Environmental Services, Inc

Date: 29-May-18

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805954

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805954-001A	TRIP BLANK-06	5/15/2018 9:30:00AM	Aqueous	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-002A	TW-3	5/15/2018 11:16:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-002B	TW-3	5/15/2018 11:16:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-002C	TW-3	5/15/2018 11:16:00AM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-002D	TW-3	5/15/2018 11:16:00AM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-002E	TW-3	5/15/2018 11:16:00AM	Groundwater	ION SCAN			05/16/2018
1805954-003A	TW-4	5/15/2018 1:18:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-003B	TW-4	5/15/2018 1:18:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-003C	TW-4	5/15/2018 1:18:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-003D	TW-4	5/15/2018 1:18:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-003E	TW-4	5/15/2018 1:18:00PM	Groundwater	ION SCAN			05/16/2018
1805954-004A	TW-5	5/15/2018 3:36:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-004B	TW-5	5/15/2018 3:36:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-004C	TW-5	5/15/2018 3:36:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-004C	TW-5	5/15/2018 3:36:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/25/2018
1805954-004D	TW-5	5/15/2018 3:36:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-004D	TW-5	5/15/2018 3:36:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018
1805954-004E	TW-5	5/15/2018 3:36:00PM	Groundwater	ION SCAN			05/16/2018
1805954-005A	MW-22	5/15/2018 11:04:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/22/2018
1805954-005B	MW-22	5/15/2018 11:04:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-005C	MW-22	5/15/2018 11:04:00AM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-005D	MW-22	5/15/2018 11:04:00AM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-005E	MW-22	5/15/2018 11:04:00AM	Groundwater	ION SCAN			05/16/2018
1805954-006A	OW-2	5/15/2018 1:51:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-006B	OW-2	5/15/2018 1:51:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-006B	OW-2	5/15/2018 1:51:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/18/2018
1805954-006C	OW-2	5/15/2018 1:51:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-006D	OW-2	5/15/2018 1:51:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-006D	OW-2	5/15/2018 1:51:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805954

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805954-006E	OW-2	5/15/2018 1:51:00PM	Groundwater	ION SCAN			05/16/2018
1805954-007A	OW-3	5/15/2018 3:47:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-007B	OW-3	5/15/2018 3:47:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-007C	OW-3	5/15/2018 3:47:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-007D	OW-3	5/15/2018 3:47:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-007D	OW-3	5/15/2018 3:47:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018
1805954-007E	OW-3	5/15/2018 3:47:00PM	Groundwater	ION SCAN			05/16/2018
1805954-008A	MW-111	5/15/2018 11:10:00AM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/22/2018
1805954-008B	MW-111	5/15/2018 11:10:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-008B	MW-111	5/15/2018 11:10:00AM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/18/2018
1805954-008C	MW-111	5/15/2018 11:10:00AM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-008C	MW-111	5/15/2018 11:10:00AM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/25/2018
1805954-008D	MW-111	5/15/2018 11:10:00AM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-008D	MW-111	5/15/2018 11:10:00AM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018
1805954-008E	MW-111	5/15/2018 11:10:00AM	Groundwater	ION SCAN			05/16/2018
1805954-009A	MW-109	5/15/2018 1:05:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-009B	MW-109	5/15/2018 1:05:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-009B	MW-109	5/15/2018 1:05:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/18/2018
1805954-009C	MW-109	5/15/2018 1:05:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-009C	MW-109	5/15/2018 1:05:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/25/2018
1805954-009D	MW-109	5/15/2018 1:05:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-009D	MW-109	5/15/2018 1:05:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018
1805954-009E	MW-109	5/15/2018 1:05:00PM	Groundwater	ION SCAN			05/16/2018
1805954-010A	MW-119	5/15/2018 4:20:00PM	Groundwater	Volatile Organic Compounds by GC/MS		5/21/2018 10:17:00AM	05/23/2018
1805954-010B	MW-119	5/15/2018 4:20:00PM	Groundwater	TCL-CHLORINATED PESTICIDES		5/16/2018 9:00:00AM	05/17/2018
1805954-010C	MW-119	5/15/2018 4:20:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-010D	MW-119	5/15/2018 4:20:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-010D	MW-119	5/15/2018 4:20:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018
1805954-010E	MW-119	5/15/2018 4:20:00PM	Groundwater	ION SCAN			05/16/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Lab Order: 1805954

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1805954-011A	DUP-4	5/15/2018 12:00:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/19/2018
1805954-011A	DUP-4	5/15/2018 12:00:00PM	Groundwater	Dissolved Metals by ICP/MS		5/18/2018 4:10:00PM	05/25/2018
1805954-011B	DUP-4	5/15/2018 12:00:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/19/2018
1805954-011B	DUP-4	5/15/2018 12:00:00PM	Groundwater	Total Metals by ICP/MS		5/17/2018 5:15:00PM	05/24/2018

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 260772

Sample ID: **MB-260772** Client ID: Units: **mg/L** Prep Date: **05/16/2018** Run No: **370726**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260772** Analysis Date: **05/17/2018** Seq No: **8220334**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000294	0	0.0005		58.7	15.4	120				
Surr: Tetrachloro-m-xylene	0.000439	0	0.0005		87.7	37	126				

Sample ID: **LCS-260772** Client ID: Units: **mg/L** Prep Date: **05/16/2018** Run No: **370726**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **260772** Analysis Date: **05/17/2018** Seq No: **8220335**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.001031	0.00010	0.0010		103	61.9	135				
Dieldrin	0.000977	0.00010	0.0010		97.7	70.3	126				
gamma-BHC	0.000976	0.000050	0.0010		97.6	70.9	129				
Heptachlor	0.000960	0.000050	0.0010		96.0	63.5	128				
Surr: Decachlorobiphenyl	0.000325	0	0.0005		65.0	15.4	120				
Surr: Tetrachloro-m-xylene	0.000457	0	0.0005		91.4	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 260772

Sample ID: **1805954-002BMS**	Client ID: **TW-3**	Units: **mg/L**	Prep Date: **05/16/2018**	Run No: **370726**
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **260772**	Analysis Date: **05/17/2018**	Seq No: **8220337**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000971	0.00010	0.0010		97.1	43.2	136				
Dieldrin	0.000941	0.00010	0.0010		94.1	44	139				
Heptachlor	0.000959	0.000050	0.0010		95.9	34.3	144				
Surr: Decachlorobiphenyl	0.000416	0	0.0005		83.1	15.4	120				
Surr: Tetrachloro-m-xylene	0.000424	0	0.0005		84.9	37	126				

Sample ID: **1805954-002BMS**	Client ID: **TW-3**	Units: **mg/L**	Prep Date: **05/16/2018**	Run No: **370726**
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **260772**	Analysis Date: **05/17/2018**	Seq No: **8220359**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
gamma-BHC	0.001821	0.00010	0.0010	0.0007176	110	53.8	141				

Sample ID: **1805954-002BMSD**	Client ID: **TW-3**	Units: **mg/L**	Prep Date: **05/16/2018**	Run No: **370726**
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **260772**	Analysis Date: **05/17/2018**	Seq No: **8220338**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000903	0.00010	0.0010		90.3	43.2	136	0.0009714	7.27	21.1	
Dieldrin	0.000872	0.00010	0.0010		87.2	44	139	0.0009411	7.62	20	
gamma-BHC	0.001534	0.000050	0.0010	0.0006701	86.4	53.8	141	0.001645	6.98	20	
Heptachlor	0.000906	0.000050	0.0010		90.6	34.3	144	0.0009589	5.71	24.4	
Surr: Decachlorobiphenyl	0.000401	0	0.0005		80.2	15.4	120	0.0004156	0	0	
Surr: Tetrachloro-m-xylene	0.000393	0	0.0005		78.7	37	126	0.0004243	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 260890

Sample ID: **MB-260890**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **MBLK**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/25/2018**	Seq No: **8238704**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260890**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **LCS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/19/2018**	Seq No: **8225185**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.1025	0.00500	0.1000		103	80	120				
Copper	0.1014	0.00200	0.1000		101	80	120				
Lead	0.09971	0.00100	0.1000		99.7	80	120				
Zinc	0.1111	0.0100	0.1000	0.001845	109	80	120				

Sample ID: **1805E48-003CMS**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **370916**
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/19/2018**	Seq No: **8225187**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09295	0.00500	0.1000		93.0	75	125				
Lead	0.09102	0.00100	0.1000		91.0	75	125				
Zinc	4.565	0.0100	0.1000	4.870	-305	75	125				S

Sample ID: **1805E48-003CMS**	Client ID:			Units: **mg/L**	Prep Date: **05/18/2018**	Run No: **371273**
SampleType: **MS**	TestCode: **Dissolved Metals by ICP/MS SW6020B**			BatchID: **260890**	Analysis Date: **05/24/2018**	Seq No: **8236868**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	2.262	0.0400	0.1000	2.118	144	75	125				S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 260890

Sample ID: **1805E48-003CMSD**	Client ID:				Units: **mg/L**		Prep Date: **05/18/2018**		Run No: **370916**	
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260890**		Analysis Date: **05/19/2018**		Seq No: **8225188**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.03584	0.00500	0.1000		35.8	75	125	0.09295	88.7	20	SR
Lead	0.03430	0.00100	0.1000		34.3	75	125	0.09102	90.5	20	SR
Zinc	4.609	0.0100	0.1000	4.870	-261	75	125	4.565	0.969	20	S

Sample ID: **1805E48-003CMSD**	Client ID:				Units: **mg/L**		Prep Date: **05/18/2018**		Run No: **371273**	
SampleType: **MSD**	TestCode: **Dissolved Metals by ICP/MS SW6020B**				BatchID: **260890**		Analysis Date: **05/24/2018**		Seq No: **8236869**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	2.353	0.0400	0.1000	2.118	235	75	125	2.262	3.95	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 260895

Sample ID: **MB-260895**	Client ID:			Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370915**
SampleType: **MBLK**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260895**	Analysis Date: **05/22/2018**	Seq No: **8236013**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-260895**	Client ID:			Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370915**
SampleType: **LCS**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260895**	Analysis Date: **05/19/2018**	Seq No: **8225140**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09387	0.00500	0.1000		93.9	80	120				
Copper	0.09371	0.00200	0.1000		93.7	80	120				
Lead	0.09699	0.00100	0.1000		97.0	80	120				
Zinc	0.09411	0.0100	0.1000	0.002870	91.2	80	120				

Sample ID: **1805954-002DMS**	Client ID: **TW-3**			Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370915**
SampleType: **MS**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260895**	Analysis Date: **05/19/2018**	Seq No: **8225142**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09524	0.00500	0.1000		95.2	75	125				
Copper	0.7569	0.00200	0.1000	0.6519	105	75	125				
Lead	0.1016	0.00100	0.1000	0.002450	99.2	75	125				
Zinc	1.897	0.0100	0.1000	1.757	140	75	125				S

Sample ID: **1805954-002DMSD**	Client ID: **TW-3**			Units: **mg/L**	Prep Date: **05/17/2018**	Run No: **370915**
SampleType: **MSD**	TestCode: **Total Metals by ICP/MS** **SW6020B**			BatchID: **260895**	Analysis Date: **05/19/2018**	Seq No: **8225143**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09429	0.00500	0.1000		94.3	75	125	0.09524	1.01	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 260895

Sample ID: **1805954-002DMSD** Client ID: **TW-3** Units: **mg/L** Prep Date: **05/17/2018** Run No: **370915**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **260895** Analysis Date: **05/19/2018** Seq No: **8225143**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.7659	0.00200	0.1000	0.6519	114	75	125	0.7569	1.18	20	
Lead	0.1013	0.00100	0.1000	0.002450	98.8	75	125	0.1016	0.382	20	
Zinc	1.909	0.0100	0.1000	1.757	152	75	125	1.897	0.628	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 261105

Sample ID: **MB-261105**	Client ID:		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/22/2018**	Seq No: **8228296**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	0.0050									
1,1,2,2-Tetrachloroethane	BRL	0.0050									
1,1,2-Trichloroethane	BRL	0.0050									
1,1-Dichloroethane	BRL	0.0050									
1,1-Dichloroethene	BRL	0.0050									
1,1-Dichloropropene	BRL	0.0050									
1,2,4-Trichlorobenzene	BRL	0.0050									
1,2-Dichloroethane	BRL	0.0050									
1,2-Dichloropropane	BRL	0.0050									
1,4-Dioxane	BRL	0.15									
2-Butanone	BRL	0.050									
4-Methyl-2-pentanone	BRL	0.010									
Acetone	BRL	0.050									
Benzene	BRL	0.0050									
Carbon disulfide	BRL	0.0050									
Carbon tetrachloride	BRL	0.0050									
Chlorobenzene	BRL	0.0050									
Chloroethane	BRL	0.010									
Chloroform	BRL	0.0050									
Chloromethane	BRL	0.010									
cis-1,2-Dichloroethene	BRL	0.0050									
Cyclohexane	BRL	0.0050									
Ethylbenzene	BRL	0.0050									
Isopropylbenzene	BRL	0.0050									
Methylene chloride	BRL	0.0050									
Naphthalene	BRL	0.0050									
Styrene	BRL	0.0050									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 261105

Sample ID: **MB-261105**	Client ID:		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/22/2018**	Seq No: **8228296**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	0.0050									
Toluene	BRL	0.0050									
trans-1,2-Dichloroethene	BRL	0.0050									
Trichloroethene	BRL	0.0050									
Trichlorofluoromethane	BRL	0.0050									
Vinyl chloride	BRL	0.0020									
Xylenes, Total	BRL	0.0050									
Surr: 4-Bromofluorobenzene	0.04805	0	0.0500		96.1	68	127				
Surr: Dibromofluoromethane	0.04733	0	0.0500		94.7	84.4	122				
Surr: Toluene-d8	0.04988	0	0.0500		99.8	80.1	116				

Sample ID: **MB-261105**	Client ID:		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **MBLK**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/22/2018**	Seq No: **8229513**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Isobutyl Alcohol	BRL	0.20									
Tetrahydrofuran	BRL	0.010									
Surr: 4-Bromofluorobenzene	0.04833	0	0.0500		96.7	68	127				
Surr: Dibromofluoromethane	0.04958	0	0.0500		99.2	84.4	122				
Surr: Toluene-d8	0.05109	0	0.0500		102	80.1	116				

Sample ID: **LCS-261105**	Client ID:		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/22/2018**	Seq No: **8228293**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.04589	0.0050	0.0500		91.8	69	136				
Benzene	0.04619	0.0050	0.0500		92.4	73.7	126				
Chlorobenzene	0.05056	0.0050	0.0500		101	73.5	124				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 261105

Sample ID: **LCS-261105**	Client ID:		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **LCS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/22/2018**	Seq No: **8228293**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	0.04426	0.0050	0.0500		88.5	76.8	125				
Trichloroethene	0.04667	0.0050	0.0500		93.3	70.9	124				
Surr: 4-Bromofluorobenzene	0.04810	0	0.0500		96.2	68	127				
Surr: Dibromofluoromethane	0.04784	0	0.0500		95.7	84.4	122				
Surr: Toluene-d8	0.04897	0	0.0500		97.9	80.1	116				

Sample ID: **1805954-006AMS**	Client ID: **OW-2**		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **MS**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/23/2018**	Seq No: **8228843**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.5089	0.050	0.5000		102	65.7	143				
Benzene	0.4751	0.050	0.5000		95.0	66.1	137				
Chlorobenzene	0.6569	0.050	0.5000	0.1479	102	70.9	132				
Toluene	0.4444	0.050	0.5000		88.9	63.8	141				
Trichloroethene	0.4828	0.050	0.5000		96.6	70.6	128				
Surr: 4-Bromofluorobenzene	0.4898	0	0.5000		98.0	68	127				
Surr: Dibromofluoromethane	0.4953	0	0.5000		99.1	84.4	122				
Surr: Toluene-d8	0.5052	0	0.5000		101	80.1	116				

Sample ID: **1805954-006AMSD**	Client ID: **OW-2**		Units: **mg/L**	Prep Date: **05/21/2018**	Run No: **371040**
SampleType: **MSD**	TestCode: **Volatile Organic Compounds by GC/MS SW8260B**		BatchID: **261105**	Analysis Date: **05/23/2018**	Seq No: **8228844**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.4595	0.050	0.5000		91.9	65.7	143	0.5089	10.2	17.7	
Benzene	0.4931	0.050	0.5000		98.6	66.1	137	0.4751	3.72	20	
Chlorobenzene	0.6890	0.050	0.5000	0.1479	108	70.9	132	0.6569	4.77	20	
Toluene	0.4560	0.050	0.5000		91.2	63.8	141	0.4444	2.58	20	
Trichloroethene	0.4760	0.050	0.5000		95.2	70.6	128	0.4828	1.42	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: 261105

Sample ID: **1805954-006AMSD** Client ID: **OW-2** Units: **mg/L** Prep Date: **05/21/2018** Run No: **371040**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **261105** Analysis Date: **05/23/2018** Seq No: **8228844**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: 4-Bromofluorobenzene	0.4902	0	0.5000		98.0	68	127	0.4898	0	0	
Surr: Dibromofluoromethane	0.4740	0	0.5000		94.8	84.4	122	0.4953	0	0	
Surr: Toluene-d8	0.5044	0	0.5000		101	80.1	116	0.5052	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: R370552

Sample ID: **MB-R370552**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370552**	
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**				BatchID: **R370552**		Analysis Date: **05/16/2018**		Seq No: **8215232**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370552**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370552**	
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370552**		Analysis Date: **05/16/2018**		Seq No: **8215233**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.421	0.25	5.000		108	90	110				
Sulfate	24.57	1.0	25.00		98.3	90	110				

Sample ID: **1805G66-003CMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370552**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370552**		Analysis Date: **05/16/2018**		Seq No: **8215248**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.893	0.25	5.000	0.2455	113	90	110				S
Sulfate	26.27	1.0	25.00	1.276	100.0	90	110				

Sample ID: **1805G66-005CMS**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370552**	
SampleType: **MS**	TestCode: **ION SCAN SW9056A**				BatchID: **R370552**		Analysis Date: **05/16/2018**		Seq No: **8215250**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.709	0.25	5.000	0.2501	109	90	110				
Sulfate	25.90	1.0	25.00	1.380	98.1	90	110				

Sample ID: **1805G66-003CMSD**	Client ID:				Units: **mg/L**		Prep Date:		Run No: **370552**	
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**				BatchID: **R370552**		Analysis Date: **05/16/2018**		Seq No: **8215249**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.917	0.25	5.000	0.2455	113	90	110	5.893	0.411	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: R370552

Sample ID: **1805G66-003CMSD** Client ID:
SampleType: **MSD** TestCode: **ION SCAN SW9056A**
Units: **mg/L** Prep Date: Run No: **370552**
BatchID: **R370552** Analysis Date: **05/16/2018** Seq No: **8215249**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Sulfate	26.30	1.0	25.00	1.276	100	90	110	26.27	0.113	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL Atlanta
Workorder: 1805954

ANALYTICAL QC SUMMARY REPORT

BatchID: R370564

Sample ID: **MB-R370564**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370564**
SampleType: **MBLK**	TestCode: **ION SCAN SW9056A**			BatchID: **R370564**	Analysis Date: **05/16/2018**		Seq No: **8215389**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	BRL	0.25									
Sulfate	BRL	1.0									

Sample ID: **LCS-R370564**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370564**
SampleType: **LCS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370564**	Analysis Date: **05/16/2018**		Seq No: **8215390**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	5.340	0.25	5.000		107	90	110				
Sulfate	26.16	1.0	25.00		105	90	110				

Sample ID: **1805G65-002CMS**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370564**
SampleType: **MS**	TestCode: **ION SCAN SW9056A**			BatchID: **R370564**	Analysis Date: **05/16/2018**		Seq No: **8215401**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.129	0.25	5.000	0.2911	117	90	110				S
Sulfate	29.58	1.0	25.00	3.775	103	90	110				

Sample ID: **1805G65-002CMSD**	Client ID:			Units: **mg/L**	Prep Date:		Run No: **370564**
SampleType: **MSD**	TestCode: **ION SCAN SW9056A**			BatchID: **R370564**	Analysis Date: **05/16/2018**		Seq No: **8215403**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrate	6.145	0.25	5.000	0.2911	117	90	110	6.129	0.255	20	S
Sulfate	29.96	1.0	25.00	3.775	105	90	110	29.58	1.25	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

FIELD SAMPLING FORMS

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-1B DEPTH TO PRODUCT: NA DATE: 5-8-2018

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 13:38 (Sample Collected at 15:52)

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 23.57 (ft btoc) TOTAL DEPTH: 32.43 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 27.0

Arrived at: 13:38 PURGE VOLUME: 0.163×8.86×3 = 4.3 gal (gals)

Initial PID = NA WELL DIAMETER (inches): (circle one)

Purging PID = NA (2-inch or 1-inch)

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO mg/L	ORP mV	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 15:10		6.18	20.42	0.303	---	5.21	110	400 ( )	
15:20	1.0	5.91	20.49	0.306	0.0	4.75	143	400	23.85
15:30	2.0	6.19	20.81	0.306	0.0	4.61	138	300	23.82
15:35	2.4	6.19	21.16	0.307	0.0	4.49	140	300	23.81
15:40	3.0	6.22	21.29	0.304	0.0	4.54	143	300	23.85
15:45	3.5	6.18	21.20	0.305	0.0	4.52	148	300	23.88
15:50	4.0	6.18	21.20	0.305	0.0	4.51	148	300	23.87
15:52	4.5	Sample collected from MW-1B							

COMMENTS: Purge water clear

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	8 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]
	BLK 5-8-18			

GENERAL INFORMATION			
WEATHER:	Partly Cloudy, Temp 80°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-22 DEPTH TO PRODUCT:_____ DATE: 5-15-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 11:04

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF:_____ DEPTH TO WATER: 18.33 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 24

TOTAL DEPTH: 29.15 (ft btoc)

Arrived at: 09:30 PURGE VOLUME: 5.3 (gals) 0.163×10.8×3 = 5.3 WELL DIAMETER (inches): (circle one) (2-inch or) 1-inch

Initial PID = _____

Purging PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 10:18		4.18	18.96	0.702	41.3	7.92	213	300 ( )	
10:28	2.0	4.31	19.10	0.691	0.0	4.27	217	400	19.30
10:38	3.0	4.37	19.31	0.682	0.0	1.08	223	300	19.40
10:48	4.0	4.35	19.19	0.686	0.0	0.97	224	400	19.45
10:58	5.0	4.34	19.14	0.687	0.0	0.95	224	400	19.40
11:03	5.5	4.32	19.28	0.688	0.0	0.92	224	400	19.35
11:04	Sample collected from MW-22								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	~~2~~ 3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	Cloudy, 80°F, Humid	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: BEN RHINER	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-25 DEPTH TO PRODUCT: NA DATE: 5/17/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1108

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 27.19 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 29

TOTAL DEPTH: 29.80 (ft btoc)

Arrived at: 1010 PURGE VOLUME: 2.61 x 0.163 = 0.43 x 3 (gals) = 1.3 gal WELL DIAMETER (inches): (circle one) (2-inch or) 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1037	0	4.94	21.65	0.573	0.0	3.62	257	200 ( )	27.64
1047	0.5	4.22	19.97	0.545	0.0	2.33	271	200	27.70
1052	0.75	4.09	19.39	0.549	0.0	2.33	279	200	27.70
1057	1.0	4.09	19.13	0.551	0.0	2.30	281	200	27.76
1102	1.25	4.07	19.46	0.546	0.0	2.22	286	200	27.77
1107	1.5	4.05	19.66	0.541	0.0	2.17	290	200	27.78

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	~~2~~ 3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Overcast, Temp 75°C		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-26 DEPTH TO PRODUCT: NA DATE: 5/10/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1620

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 9.45 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 18

TOTAL DEPTH: 21.27 (ft btoc)

Arrived at: 1446 PURGE VOLUME: 11.82 x 0.163 = 1.93 x 3 (gals) 5.8 gal WELL DIAMETER (inches): (circle one) (2-inch or) 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1517	0	4.98	26.93	0.312	5.67	13.05	190	300 ( )	9.82
1527	0.75	4.86	23.31	0.315	5.19	7.96	203	300	9.85
1537	1.75	4.64	19.54	0.340	5.13	2.25	225	400	9.91
1547	2.75	4.43	18.06	0.376	5.13	1.59	248	400	9.93
1557	3.75	4.33	17.94	0.366	2.69	1.65	261	400	9.93
1602	4.25	4.78	18.04	0.379	1.28	1.28	241	400	9.93
1607	4.75	4.64	17.94	0.383	1.26	1.23	250	400	9.93
1612	5.25	4.62	17.89	0.383	1.20	1.16	255	400	9.93
1618	5.8	4.56	17.87	0.383	1.36	1.11	259	400	9.93

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
~~250~~ 500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
~~250~~ 500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3/2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Clear, Temp 83°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-101 DEPTH TO PRODUCT: _____ DATE: 5-9-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 13:01

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 14.86 (ft btoc)

TOTAL DEPTH: 27.85 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 18.0

Arrived at: 11:05

Initial PID = _____

Purging PID = _____

PURGE VOLUME: 6.4 gal. (gals) 0.163 × 12.99 × 3 = 6.4

WELL DIAMETER (inches): (circle one) (2-inch or) 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 11:45		4.68	19.90	0.408	---	4.65	202	360 ( )	15.04
11:55	1 gal.	4.64	20.53	0.386	0.0	1.87	217	300	15.41
12:05	2 gal.	4.60	20.76	0.383	0.0	1.29	233	300	15.46
12:10	2.5 gal.	4.63	21.20	0.380	0.0	1.33	237	250	15.45
12:20	3.0 gal.	4.63	22.08	0.382	0.0	1.96	245	250	15.46
12:25	3.5 gal.	4.63	22.08	0.382	1.63	1.37	256	300	15.51
12:30	4.0 gal.	4.58	20.95	0.377	0.0	1.15	259	250	15.55
12:35	4.5 gal.	4.56	20.88	0.376	0.0	1.16	262	250	15.55
12:40	5.0 gal.	4.61	21.00	0.376	0.0	1.15	262	250	15.54
12:45	5.5 gal.	4.61	21.48	0.376	0.0	1.13	264	250	15.52
12:50	6.0 gal.	4.61	21.49	0.376	0.0	1.13	264	250	15.52
12:55	6.5 gal.	4.62	21.49	0.375	0.0	1.12	264	250	15.52
13:01	Sample collected from MW-101								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	~~3~~ 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]
	BLR 5-9-18			

GENERAL INFORMATION			
WEATHER:	Sunny 85°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	BEN RHINER	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-102 DEPTH TO PRODUCT: NA DATE: 5-8-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1215

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 22.74 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 31'

TOTAL DEPTH: 33.14 (ft btoc)

10.40 x 0.16 = 1.66 x 3 = 4.99

Arrived at: _____ PURGE VOLUME: 4.99 (gals) WELL DIAMETER (inches): (circle one)

Initial PID = NA (2-inch) or 1-inch

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1035	0.25	4.51	22.07	0.517	36.3	2.10	257	200 ( )	23.11
1050	1.0	4.49	21.74	0.503	24.1	2.07	262	|	23.11
1110	2.0	4.47	21.62	0.552	21.4	1.93	265	|	23.11
1130	3.0	4.57	21.65	0.525	16.1	1.81	262	|	23.11
1150	4.0	4.64	21.66	0.500	15.6	1.77	259	|	23.11
1200	4.5	4.63	21.67	0.496	10.9	1.78	258	|	23.11
1210	5.0	4.64	21.64	0.497	6.34	1.83	256	√	23.11
1215	Collect		Sample						

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	Hot - Cloudy - Humid	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: Ever Guillen	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-104A DEPTH TO PRODUCT: NA DATE: 5-9-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1255

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 13.26 (ft btoc)

TOTAL DEPTH: 39.87 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 37'

Arrived at: _____ PURGE VOLUME: 12.77 (gals) 26.61 x 0.16 = 4.26 x 3 = 12.77

Initial PID = NA WELL DIAMETER (inches): (circle one)

Purging PID = NA 2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1042	0.25	7.59	22.74	0.613	221	0.91	-38	400 ( )	13.67
1050	1.0	7.36	22.18	0.627	207	0.75	-43		13.67
1110	3.0	7.25	22.38	0.627	111.0	0.69	-43		13.67
1130	5.0	7.23	22.40	0.627	65.3	0.64	-42		13.68
1140	6.0	7.11	22.31	0.629	25.2	0.61	-45		13.68
1150	7.0	7.08	21.89	0.627	15.3	0.59	-46		13.68
1200	8.0	7.08	21.88	0.629	15.0	0.58	-47		13.69
1220	10.0	7.07	21.95	0.630	11.1	0.57	-47		13.69
1240	12.0	7.06	21.89	0.630	8.40	0.55	-48		1369
1250	13.0	7.06	22.60	0.630	7.21	0.53	-49		13.69
1255	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	8 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	HOT - CLOUDY - HUMID	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: EVER GUILLEN	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-104D DEPTH TO PRODUCT: NA DATE: 5-8-18 purged

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1010 (5/9/18 sampled)

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 16.59 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 80'

TOTAL DEPTH: 82.82 (ft btoc)

66.23 x 0.16 = 10.60 x 3 = 31.79

Arrived at: _____ PURGE VOLUME: 31.79 (gals)

Initial PID = NA

Purging PID = NA

WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1324	0.5	6.60	21.43	2.71	367	0.57	65	500 ( )	17.03
1328	1.0	6.48	22.96	2.65	45.4	0.44	61		20.69
1342	3.0	6.55	~~22.95~~ 22.51	2.53	39.7	0.41	60		28.11
1358	5.0	6.69	22.19	2.70	32.0	0.45	56		35.27
1414	7.0	6.90	22.76	2.72	20.1	0.42	44		42.41
1430	9.0	6.96	22.49	2.78	29.9	0.43	35		50.13
1446	11.0	7.07	22.57	2.85	12.6	0.41	30		57.29
1502	13.0	7.42	22.86	2.81	12.4	0.40	11		65.46
1518	15.0	7.48	22.87	2.82	16.5	0.40	2		71.93
1534	17.0	7.44	22.85	2.85	15.8	0.40	-5		79.82
1535	Well DRY								

COMMENTS: Water HAS ODOR (SOLVENT LIKE) & IS A BIT FOAMY — WELL DRY @ 79.82 — WILL ALLOW WELL TO RECOVER BEFORE COLLECTING SAMPLE

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	~~3~~ 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	HOT - CLOUDY - HUMID	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: EVER GUILLEN		OBSERVER:

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-105 DEPTH TO PRODUCT: NA DATE: 5-10-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1150

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 11,90 (ft btoc)

TOTAL DEPTH: 27,40 (ft btoc)

DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc) >>>>>>>>> 26'

15,5 X 0,16 = 2,48 X 3 = 7,44

Arrived at: _____ PURGE VOLUME: 7,44 (gals)

Initial PID = NA

Purging PID = NA

WELL DIAMETER (inches): (circle one)
2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1032	0,25	6,37	19,27	0,554	510	5,14	138	400 ( )	12,31
1040	1,0	6,21	19,05	0,554	299	2,89	143		12,88
1050	2,0	6,16	19,83	0,559	206	2,74	142		13,47
1100	3,0	6,19	20,61	0,564	146	4,57	138		14,10
1110	4,0	6,17	21,66	0,562	54,0	4,58	141		14,76
1120	5,0	6,06	22,42	0,562	30,2	4,60	149		15,34
1130	6,0	6,05	22,19	0,563	11,3	4,41	151		15,93
1140	7,0	6,04	22,81	0,563	14,4	4,37	152		16,55
1145	7,5	6,02	22,93	0,565	9,60	4,33	154		16,87
1150	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	0 ~~3~~	HCL	8260	~~Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]~~
				No VOCs Collected

GENERAL INFORMATION			
WEATHER:	Hot - Clear - Humid		
SHIPPED VIA:	FedEx or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	Ever Guillen	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-106D DEPTH TO PRODUCT: NA DATE: 5-11-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1220

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 34.83 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 71'

TOTAL DEPTH: 74.14 (ft btoc) 39.34 X 0.16 = 6.29 X 3 = 18.88

Arrived at: _____ PURGE VOLUME: 18.88 (gals) WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 937	0.25	6.54	20.84	0.776	16.9	2.03	90	400 ( )	~~35.34~~ 35.34
943	1.0	6.49	20.62	0.771	7.54	1.35	94		35.18
959	3.0	6.49	20.80	0.771	3.65	1.29	96		36.34
1015	5.0	6.47	21.19	0.771	2.80	1.24	99		37.56
1031	7.0	6.34	21.25	0.766	1.39	1.13	108		38.75
1047	9.0	6.31	21.34	0.763	2.14	1.09	110		39.98
1103	11.0	6.31	21.52	0.760	1.79	1.08	111		41.13
1119	13.0	6.30	21.65	0.751	1.27	1.01	112		42.34
1135	15.0	6.33	21.74	0.731	0.71	1.00	113		43.61
1151	17.0	6.34	21.82	0.726	0.68	0.98	114		44.84
1159	18.0	6.34	21.97	0.715	0.43	0.84	115		46.15
1215	19.0	6.33	22.02	0.715	0.37	0.80	116		47.51
1220	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3/2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	HOT - HUMID - ~~HOT~~ HAZY		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: EVER GUILLEN		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW107D DEPTH TO PRODUCT: NA DATE: 5-9-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1610

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 20.67 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 47'

TOTAL DEPTH: 50.04 (ft btoc) 29.37 x 0.16 = 4.69 x 3 = 14.09

Arrived at: _____ PURGE VOLUME: 14.09 (gals) WELL DIAMETER (inches): (circle one) (2-inch) or 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1417	0.25	7.21	23.23	0.269	6.89	2.98	113	500 ( )	21.77
1423	1.0	6.61	20.69	0.272	291.0	2.45	132		22.94
1439	3.0	6.45	21.71	0.270	230	2.45	140		24.56
1455	5.0	6.31	21.25	0.271	113	2.58	152		26.13
1511	7.0	6.29	21.02	0.272	58.7	2.77	155		27.61
1527	9.0	6.23	21.74	0.274	16.6	2.57	165		29.33
1543	11.0	6.20	21.87	0.274	11.5	2.39	169		31.57
1551	12.0	6.19	21.86	0.274	9.30	2.35	170		31.89
1559	13.0	6.19	21.72	0.274	7.06	2.36	172		31.93
1607	14.0	6.19	21.67	0.273	6.08	2.33	175		31.97
1610	collect		Sample						

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	HOT – CLEAR – HUMID	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: EVER GUILLEN	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-108 DEPTH TO PRODUCT: _____ DATE: 5-10-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 11:51

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 18.98 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 30

TOTAL DEPTH: 36.34 (ft btoc)

Arrived at: 10:15 PURGE VOLUME: 8.5 (gals) 0.163 x (36.34 - 18.98) x 3 = 8.5 (17.36)

Initial PID = _____ WELL DIAMETER (inches): (circle one)

Purging PID = _____ 2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 10:40		5.05	19.88	0.479	85.0	6.96	202	400 ( )	19.31
10:50	2.0	5.02	19.90	0.477	32.1	2.84	202	400	19.29
10:55	2.5	5.05	19.80	0.477	11.4	1.03	200	400	19.20
11:00	3.0	5.13	20.57	0.478	0.0	0.99	196	400	19.26
11:05	3.4	5.17	20.52	0.479	0.0	0.97	194	400	19.34
11:10	4.0	5.25	20.19	0.481	0.0	0.93	190	400	19.47
11:15	4.5	5.31	19.65	0.486	0.0	0.90	187	400	19.45
11:20	5.0	5.35	19.54	0.495	0.0	0.84	185	400	19.42
11:25	5.5	5.36	19.55	0.495	0.0	0.84	184	400	19.40
11:30	6.0	5.36	19.57	0.496	0.0	0.82	183	500	19.37
11:35	6.7	5.33	19.69	0.497	0.0	0.80	184	500	19.34
11:40	7.4	5.30	19.88	0.498	0.0	0.79	185	500	19.38
11:45	8.1	5.30	19.95	0.499	0.0	0.79	184	400	19.35
11:50	8.8	5.32	20.02	0.500	0.0	0.77	182	400	19.33

COMMENTS: Well initially turbid, became clear.
Lots of mosquitos.
Excessive vegetation, requires bushwacking to reach well.
Collected sample from MW-108 at 11:51

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Sunny 80°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	BEN RHINER	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-109 DEPTH TO PRODUCT: NA DATE: 5-15-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1305

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: DUP-4@1200 DEPTH TO WATER: 13.86 (ft btoc)

TOTAL DEPTH: 33.55 (ft btoc)

19.69 x .16 = 3.15 x 3 = 9.45

DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc) >>>>>>>>> 30'

Arrived at:

Initial PID = NA

Purging PID = NA

PURGE VOLUME: 9.45 (gals)

WELL DIAMETER (inches): (circle one)
(2-inch) or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1147	0.25	5.01	19.70	2.40	5.86	0.54	158	500 ( )	14.17
1155	1.0	4.90	19.74	2.41	1.42	0.50	159	500	14.17
1211	3.0	4.77	19.85	2.45	0.0	0.44	148		14.17
1227	5.0	4.74	19.88	2.45	0.0	0.42	148		14.17
1243	7.0	4.87	19.90	2.45	0.0	0.40	141		14.17
1251	8.0	4.81	19.85	2.46	0.0	0.39	145		14.17
1259	9.0	4.79	19.86	2.46	0.0	0.39	146		14.17
1303	9.5	4.78	19.87	2.46	0.0	0.38	147		14.17
1305	Collect Sample								

COMMENTS: ALSO Collected DUP-4@1200 (TOTAL & DISSOLVED METALS ONLY)

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	~~3~~ 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Hot - Humid - Cloudy - Some Rain		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Enes Guillen		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-110 DEPTH TO PRODUCT: _____ DATE: 5-11-2018

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 13:31

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 28.80 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc)

TOTAL DEPTH: 78.93 (ft btoc)

Arrived at: 10:20 PURGE VOLUME: 24.5 (gals) 0.163×(78.93-28.80)×3=24.5 WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = _____

Purging PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 11:00		5.20	18.72	0.644	0.0	3.34	183	600 ( )	
11:15	3.5	5.13	20.01	0.635	0.0	0.96	192	600	35.40
11:30	5.5	5.09	20.19	0.634	0.0	0.80	192	500	35.44
11:45	7.5	5.10	20.19	0.634	0.0	0.77	190	600	35.59
12:00	10.2	5.11	20.23	0.634	0.0	0.73	185	600	35.68
12:15	13.5	5.05	20.29	0.635	0.0	0.69	182	600	35.61
12:30	16.0	5.06	20.34	0.635	0.0	0.66	176	600	35.69
12:45	17.5	5.10	20.33	0.635	0.0	0.64	170	500	35.71
13:00	19.5	5.10	20.29	0.634	0.0	0.64	170	800	36.81
13:15	22.0	5.10	20.21	0.633	0.0	0.62	169	800	37.79
13:25	24.0	5.09	20.10	0.633	0.0	0.60	170	700	37.68
13:30	24.5	5.10	20.08	0.634	0.0	0.60	169	700	37.62
13:31	Collected sample from MW-110								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Sunny, 85°F, Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-111 DEPTH TO PRODUCT: NA DATE: 5-15-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1110

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 18.80 (ft btoc)

TOTAL DEPTH: 46.50 (ft btoc) 27.70 x .16 = 4.43 x 3 = 13.30

>>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 42'

Arrived at: _____ PURGE VOLUME: 13.30 (gals)

Initial PID = NA

Purging PID = NA

WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 0922	0.25	6.04	20.21	0.794	171	2.09	116	500 ( )	21.82
0928	1.0	6.15	20.25	0.795	118	1.67	108	500	21.82
0944	3.0	6.15	20.33	0.797	35.5	1.06	108		21.82
1000	5.0	6.16	20.39	0.799	15.3	0.90	108		21.82
1024	8.0	6.17	20.36	0.801	6.62	0.84	107		21.82
1048	11.0	6.18	20.39	0.802	3.38	0.83	107		21.82
1056	12.0	6.26	20.40	0.804	2.17	0.82	106		21.82
1104	13.0	6.25	20.37	0.804	1.28	0.76	106		21.82
1108	13.5	6.26	20.36	0.804	0.91	0.72	106		21.82
1110	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	HOT - CLOUDY - HUMID - SOME RAIN		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	EVER GUILLEN	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-112 DEPTH TO PRODUCT:_____ DATE: 5-10-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 15:31

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF:_____ DEPTH TO WATER: 13.45 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 19

TOTAL DEPTH: 25.56 (ft btoc)

Arrived at: 13:45 PURGE VOLUME: 5.9 (gals) 0.163 x (25.56 - 13.45) x 3 = 5.9 gal. (12.11)

Initial PID = _____ WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Purging PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 14:10		5.68	19.52	0.826	0.0	2.12	137	300 ( )	13.81
14:20	0.5	5.64	19.46	0.822	0.0	1.52	138	300	13.89
14:30	1.5	5.62	19.43	0.823	0.0	1.01	140	300	13.88
14:40	2.3	5.61	19.35	0.822	0.0	0.98	140	300	13.87
14:50	3.0	5.62	19.13	0.821	0.0	0.92	141	300	13.87
14:55	3.5	5.66	18.08	0.813	0.0	0.84	140	300	13.91
15:00	4.0	5.63	18.90	0.797	0.0	0.79	144	300	13.93
15:05	4.5	5.59	18.81	0.795	0.0	0.78	145	200	13.85
15:10	5.0	5.60	18.96	0.792	0.0	0.80	143	200	13.80
15:15	5.3	5.63	19.24	0.796	0.0	0.81	141	200	13.76
15:20	5.5	5.66	20.59	0.795	0.0	0.83	140	200	13.71
15:25	5.8	5.68	21.06	0.793	0.0	0.83	139	200	13.69
15:30	6.0	5.64	20.68	0.794	0.0	0.84	138	200	13.74
15:31	Collected Sample From MW-112								

COMMENTS: Trees growing around well pad - roots may grow into screen in future
Excessive vegetation, bushwacking required to reach well.

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Mostly Sunny 88°F		
SHIPPED VIA:	FedEx or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	BEN RHINER	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-113 DEPTH TO PRODUCT: NA DATE: 5-14-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1210

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: DUP-2@1200 DEPTH TO WATER: 28.39 (ft btoc)

TOTAL DEPTH: 44.12 (ft btoc)

15.73 X 0.16 = 2.51 X 3 = 7.55

DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc) >>>>>>>>> 42'

Arrived at:

Initial PID = NA

Purging PID = NA

PURGE VOLUME: 7.55 (gals)

WELL DIAMETER (inches): (circle one)
2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 930	0.25	4.04	23.85	1.37	222	0.99	272	200 ( )	30.35
945	1.0	4.00	23.49	1.36	186	0.91	285		30.35
1005	2.0	3.97	23.43	1.35	153	0.82	307		30.35
1025	3.0	3.94	23.81	1.35	136	0.74	319		30.35
1045	4.0	3.94	23.56	1.37	109	0.72	324		30.75
1105	5.0	3.92	23.91	1.37	79.6	0.66	333		30.75
1125	6.0	3.92	23.95	1.37	47.7	0.61	338		30.75
1145	7.0	3.90	24.16	1.36	14.6	0.55	342		30.75
1155	7.5	3.90	23.86	1.37	7.45	0.54	344		30.75
1205	8.0	3.90	23.94	1.37	5.69	0.53	347		30.75
1210	COLLECT	SAMPLE							

COMMENTS: ALSO COLLECTED DUP-2@1200 (NITRATE & SULFATE ONLY)

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3/2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]
500ML PL	1	NONE	9056	DUP-2@1200

GENERAL INFORMATION			
WEATHER:	HOT - CLEAR - HUMID		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: EVER GUILLEN		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-114 DEPTH TO PRODUCT: NA DATE: 5-14-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1610

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 25.41 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 44'

TOTAL DEPTH: 46.18 (ft btoc) 20.77 x .16 = 3.32 x 3 = 9.96

Arrived at: _____ PURGE VOLUME: 9.96 (gals)

Initial PID = NA

Purging PID = NA

WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1402	0.25	4.18	29.32	0.889	450	0.55	217	400 ( )	25.47
1410	1.0	4.19	20.61	0.904	121	0.33	222		25.47
1430	3.0	4.18	20.58	0.905	107	0.32	224		25.47
1450	5.0	4.14	20.44	0.904	91.3	0.30	231		25.48
1500	6.0	4.14	20.39	0.905	73.9	0.27	235		25.48
1510	7.0	4.07	20.15	0.910	55.6	0.25	245		25.48
1520	8.0	4.06	20.17	0.913	43.6	0.23	255		25.48
1530	9.0	4.00	20.18	0.913	33.2	0.23	256		25.48
1540	10.0	3.99	20.11	0.911		0.21	263		25.48
1550	11.0								
1600	12.0								
1610	Called it								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	HOT-Clear-HUMID		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	EVER GUILLEN	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-115 DEPTH TO PRODUCT: NA DATE: 5-10-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1435

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 13.03 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 20'

TOTAL DEPTH: 22.27 (ft btoc)

9.24 x 0.16 = 1.48 x 3 = 4.44

Arrived at: _____ PURGE VOLUME: 4.44 (gals) WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1305	0.25	4.18	18.93	0.853	58.2	0.53	291	200 ( )	13.29
1320	1.0	4.08	18.58	0.821	19.5	0.45	306		13.29
1340	2.0	3.99	18.30	0.839	3.17	0.33	334		13.29
1400	3.0	3.96	18.24	0.842	0.0	0.30	345		13.29
1410	3.5	3.96	18.26	0.843	0.0	0.29	350		13.29
1420	4.0	3.95	18.23	0.842	0.0	0.29	354		13.29
1430	4.5	3.95	18.36	0.843	0.0	0.27	358		13.29
1435	Collect		Sample						

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3/2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	Hot - Clear - Humid	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: Ever Guillen		OBSERVER:

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-116 DEPTH TO PRODUCT: _____ DATE: 5-14-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 11:51

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 28.76 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 32

TOTAL DEPTH: 33.71 (ft btoc)

Arrived at: 10:15 PURGE VOLUME: 2.4 (gals) (0.163 x 4.95 x 3) = 2.4

Initial PID = _____ WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Purging PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 10:41		4.14	23.41	0.689	0.0	4.62	200	150 ( )	
10:46	0.2	4.19	22.86	0.681	0.0	4.54	211	150	29.15
10:51	0.4	4.19	22.51	0.688	0.0	4.53	218	150	29.23
10:56	0.6	4.22	23.78	0.695	0.0	4.25	222	150	29.25
11:01	0.8	4.16	24.97	0.728	0.0	3.07	227	150	29.64
11:06	1.0	4.15	24.95	0.728	0.0	2.98	228	150	29.81
11:11	1.2	4.15	24.95	0.728	0.22	2.90	228	150	30.02
11:16	1.4	4.11	24.81	0.740	0.0	2.79	232	150	30.06
11:21	1.6	4.12	24.09	0.753	0.0	2.45	233	150	30.08
11:26	1.8	4.14	24.04	0.763	0.0	2.46	232	150	30.15
11:31	2.0	4.14	24.21	0.767	0.0	2.40	232	150	30.19
11:36	2.2	4.13	24.50	0.781	0.0	2.35	233	150	30.42
11:41	2.4	4.11	24.33	0.779	3.19	2.29	235	150	30.77
11:46	2.6	4.08	24.02	0.789	0.18	2.04	241	150	31.05
11:51	Collected sample from MW-116								
COMMENTS:	Excessive vegetation around well, including poison ivy								
	Lots of mosquitos								

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	2 ~~3~~	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	Sunny, 87°F, Humid	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: BEN RHINER		OBSERVER:

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-117 DEPTH TO PRODUCT: NA DATE: 5-10-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1630

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 12.01 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 23'

TOTAL DEPTH: 25.15 (ft btoc)

13.14 x 0.16 = 2.10 x 3 = 6.30

Arrived at: _____ PURGE VOLUME: 6.3 (gals) WELL DIAMETER (inches): (circle one) ~~2-inch~~ or 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1522	0.25	4.76	20.11	~~2044~~ 0.263	6.88	2.02	248	400 ( )	12.36
1530	1.0	4.73	18.41	0.264	>1000	1.78	251		12.36
1540	2.0	4.76	18.26	0.262	1000	1.64	252		12.36
1550	3.0	4.73	18.21	0.264	301	1.61	259		12.36
1600	4.0	4.72	18.17	0.264	160	1.60	261		12.37
1610	5.0	4.73	18.08	0.265	46.3	1.59	264		12.37
1615	5.5	4.70	18.10	0.266	18.5	1.60	268		12.37
1620	6.0	4.70	18.06	0.267	8.65	1.58	271		12.37
1625	6.5	4.70	18.07	0.267	7.09	1.59	274		12.37
1630	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	~~3~~ 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	HOT - CLOUDY - HUMID	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: EVER GUILLEN	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-119 DEPTH TO PRODUCT: NA DATE: 5-15-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1620

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 42.81 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 52'

TOTAL DEPTH: 55.13 (ft btoc)

12.32 x 1.16 = 1.97 x 3 = 5.91

Arrived at: _____ PURGE VOLUME: 5.91 (gals) WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1420	0.25	6.64	25.27	0.436	1000	1.88	41	200 ( )	
1435	1.0	6.81	22.07	0.426	205	0.38	19		
1455	2.0	6.93	21.55	0.435	85.7	0.32	9		
1515	3.0	6.96	21.51	0.433	16.4	0.25	-11		
1535	4.0	6.90	21.30	0.432	13.1	0.24	-13		
1555	5.0	6.83	21.46	0.431	7.50	0.26	-12		
1615	6.0	6.82	21.55	0.431	5.01	0.23	-10		
1620	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3 2	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Hot - Humid - Cloudy - Some Rain		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	Ever Guillen	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-120 DEPTH TO PRODUCT: NA DATE: 5-16-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1220

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 45.34 (ft btoc)

TOTAL DEPTH: 66.54 (ft btoc)

21.20 x .16 = 3.39 x 3 = 10.17

Arrived at: _____

Initial PID = NA

Purging PID = NA

PURGE VOLUME: 10.17 (gals)

>>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 63'

WELL DIAMETER (inches): (circle one)
2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1032	0.25	6.77	21.15	0.499	168	1.45	148	400 ( )	45.49
1040	1.0	6.43	22.06	0.502	92.2	1.42	123		45.49
1050	2.0	6.22	22.30	0.526	42.6	1.12	121		45.49
1110	4.0	6.10	22.48	0.542	19.7	0.86	126		45.49
1130	6.0	6.07	22.56	0.546	12.3	0.83	127		45.49
1150	8.0	6.05	22.53	0.547	6.17	0.81	127		45.49
1200	9.0	6.04	22.60	0.548	3.06	0.80	128		45.49
1210	10.0	6.03	22.63	0.549	1.38	0.77	128		45.49
1215	10.5	6.03	22.65	0.549	1.19	0.76	128		45.49
1220	Collect Sample								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	WARM - HUMID - HEAVY RAIN		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: EVER GUILLEN		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: MW-121 DEPTH TO PRODUCT: NA DATE: 5-11-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1430

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 16.60 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 32'

TOTAL DEPTH: 35.67 (ft btoc)

APPX 0.16 = 3.05 x 3 = 9.15

Arrived at: _____ PURGE VOLUME: 9.15 (gals) WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = NA

Purging PID = NA

TIME P	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1317	0.25	6.78	19.99	0.533	152	1.08	18	400 ( )	
1323	1.0	6.82	19.94	0.428	149	1.47	31		
1339	3.0	6.65	21.08	0.239	96.1	1.23	79		
1347	4.0	6.38	20.17	0.236	89.3	1.33	90		
1355	5.0	6.37	19.59	0.235	58.7	1.41	102		
1403	6.0	6.36	19.72	0.234	44.6	1.42	113		
1411	7.0	6.44	20.87	0.240	38.1	4.39	129		
1419	8.0	6.49	20.39	0.246	153	4.67	138		
1423	8.5	6.49	20.72	0.246	113	4.62	142		
1427	9.0	6.49	20.63	0.247		4.58	144		
1430	Collect Sample								

COMMENTS: TURBIDITY SPIKED @ 8.0 Gallons (153 NTU) Purge Water Seems Clear - will Continue Purging to Clear Turbidity - (Will Troubleshoot to See IF IT IS Due to INSTRUMENT Fault) INSTRUMENT OK - Cal Check - 0.0 NTU =

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	Hot - Humid - Clear	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: EVER GUILLEN	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: OW-1 DEPTH TO PRODUCT: _____ DATE: 5-14-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 16:01

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 18.68 (ft btoc)

TOTAL DEPTH: 43.01 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 40

Arrived at: 13:45 PURGE VOLUME: 11.9

Initial PID = _____ (gals) 0.163 x (43.01 - 18.68) x 3 = 24.33

Purging PID = _____ WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 14:21		5.79	20.92	0.645	219	6.51	24	500 ( )	
14:30	1.0	5.81	19.90	0.650	60.1	1.61	14	500	19.06
14:40	2.5	5.84	19.96	0.677	0.0	1.13	5	500	19.05
14:50	4.0	5.87	20.29	0.698	0.0	0.78	-2	500	19.03
15:00	5.5	5.83	20.33	0.703	0.0	0.74	-1	500	19.07
15:10	6.75	5.77	20.11	0.705	0.0	0.69	1	500	19.20
15:21	8.00	5.86	19.92	0.715	0.0	0.64	-8	500	19.16
15:30	9.25	5.89	19.98	0.722	0.0	0.62	-9	500	19.11
15:40	10.5	5.88	20.19	0.722	0.0	0.60	-9	500	19.06
15:50	11.75	5.86	20.31	0.723	0.0	0.58	-9	500	19.09
16:00	12.5	5.85	20.34	0.723	0.0	0.57	-10	500	19.07
16:01	Collected sample from OW-1								

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Sunny 90°F Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: OW-2 DEPTH TO PRODUCT: _____ DATE: 5-15-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 13:51

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 19.11 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 25

TOTAL DEPTH: 43.80 (ft btoc)

Arrived at: 12:15 PURGE VOLUME: 12.1 (gals) 0.163×24.69×3 = 12.1 WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = _____

Purging PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 12:49		5.63	19.12	1.04	268	1.54	66	800 ( )	
12:59	2.5	5.69	19.45	1.10	34.3	0.99	28	800	19.70
13:09	5.0	5.70	19.46	1.10	2.38	0.95	24	800	19.75
13:19	7.0	5.71	19.48	1.15	0.00	0.87	17	800	19.70
13:29	9.0	5.71	19.56	1.31	0.00	0.77	7	800	19.71
13:39	11.0	5.71	19.53	1.33	0.00	0.73	2	800	19.70
13:44	11.5	5.71	19.55	1.34	0.00	0.71	-1	800	19.70
13:49	12.1	5.71	19.53	1.35	0.00	0.70	-3	800	19.72
13:51	Collected Sample from OW-2								

COMMENTS: Lots of mosquitos
well initially very turbid, but became clear after ~3 gallons purged

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Cloudy, 75°F, Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: OW-3 DEPTH TO PRODUCT: _____ DATE: 5-15-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 15:47

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 19.44 (ft btoc)

TOTAL DEPTH: 43.87 mud (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 34

Arrived at: 14:21 PURGE VOLUME: 11.9 (gals) 0.163 x 24.43 x 3 = 11.9

Initial PID = _____ WELL DIAMETER (inches): (circle one)

Purging PID = _____ (2-inch or) 1-inch

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 14:40		4.44	19.12	0.803	0.00	4.00	150	800 ( )	
14:50	2.5	4.63	19.29	0.798	103	1.58	156	800	19.89
14:55	3.5	4.82	19.45	0.801	92.9	1.10	151	800	19.91
15:00	4.0	4.82	19.40	0.798	34.1	0.97	154	800	19.95
15:05	5.0	4.87	19.42	0.801	0.00	0.81	154	600	19.88
15:10	6.5	4.88	19.46	0.810	0.00	0.80	154	800	19.94
15:20	8.5	4.92	20.24	0.775	0.00	0.78	156	800	19.75
15:30	10.5	4.84	19.74	0.804	0.00	0.70	159	800	19.77
15:35	11.0	4.86	19.31	0.802	0.00	0.64	159	600	19.80
15:40	11.5	4.89	19.27	0.802	0.00	0.63	158	600	19.85
15:45	12.0	4.92	19.27	0.802	0.00	0.65	157	600	19.89
15:47	Collected Sample from OW-3								

COMMENTS: Lots of Mosquitos
Well had some turbidity near start, but became clear

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Cloudy 80°F Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-1 DEPTH TO PRODUCT: NA DATE: 5/9/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1618

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 13.84 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 20

TOTAL DEPTH: 25.15 (ft btoc)

Arrived at: 1520 PURGE VOLUME: 11.31 X 0.04 = 0.45 X 3 (gals) = 1.35 gal WELL DIAMETER (inches): (circle one)

Initial PID = NA 2-inch or (1-inch)

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1540	0	6.62	26.45	0.272	10.5	2.28	51	150 ( )	17.5
1550	0.4	6.64	24.62	0.273	88.1	1.36	51	150	17.73
1555	0.6	6.57	24.16	0.275	84.2	1.26	58	150	17.89
1600	0.8	6.50	24.21	0.274	80.9	1.24	65	150	18.06
1605	1.0	6.60	24.22	0.273	73.2	1.10	63	150	18.15
1610	1.25	6.63	24.07	0.273	66.5	0.93	64	150	18.23
1615	1.5	6.59	23.87	0.273	58.3	1.08	68	150	18.28

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Clear, Temp 80°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	Daniel Howard	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-2 DEPTH TO PRODUCT: NA DATE: 5/11/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1304

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 20.03 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 27

TOTAL DEPTH: 29.38 (ft btoc)

Arrived at: 1205 PURGE VOLUME: 9.35 x 0.04 = 0.37 x 3 (gals) 1.11 gal WELL DIAMETER (inches): (circle one) 2-inch or (1-inch)

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1232	0	5.51	21.69	0.362	4.07	4.95	175	200 ( )	21.65
1237	0.25	5.66	21.25	0.343	1.86	3.32	169	200	22.02
1242	0.5	5.77	20.98	0.330	1.06	2.22	167	200	22.44
1247	0.75	5.81	20.95	0.324	0.83	1.69	169	200	22.58
1252	1.0	5.81	20.96	0.323	0.43	1.49	171	200	22.74
1257	1.25	5.82	21.01	0.322	0.45	1.38	174	200	22.84
1302	1.5	5.82	21.12	0.320	0.37	1.37	178	200	22.92

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION	
WEATHER:	Hot + Humid, Temp 80°F
SHIPPED VIA:	FedEX or lab courier
SHIPPED TO:	AES -Atlanta, GA
SAMPLER: Daniel Howard	OBSERVER:

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-3 DEPTH TO PRODUCT: NA DATE: 5/15/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1116

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 24.68 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 35

TOTAL DEPTH: 40.13 (ft btoc)

Arrived at: 1015 PURGE VOLUME: 15.45 x 0.04 = 0.62 x 3 = 1.9 (gals) WELL DIAMETER (inches): (circle one)

Initial PID = NA 2-inch or (1-inch)

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1030	0	3.53	22.99	1.00	32.3	3.11	266	200 (ml)	25.53
1040	0.5	3.51	22.47	0.957	9.17	2.26	307	200	25.53
1045	0.75	3.57	21.92	0.912	9.07	1.36	350	200	25.51
1050	1.0	3.65	21.81	0.899	6.52	1.29	355	200	25.51
1055	1.25	3.67	21.69	0.884	5.48	1.19	369	200	25.53
1100	1.5	3.67	21.56	0.879	4.57	1.47	379	200	25.53
1105	1.75	3.71	21.52	0.867	DUP 3.16	1.15	383	200	25.51
1110	2.0	3.73	21.53	0.865	2.81	1.05	387	200	25.51
1115	2.25	3.72	21.55	0.860	2.07	1.02	392	200	25.51

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Hot + Humid, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-4 DEPTH TO PRODUCT: NA DATE: 5/15/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1318

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: DEPTH TO WATER: 26.39 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 31

TOTAL DEPTH: 33.77 (ft btoc)

Arrived at: 1225 PURGE VOLUME: 7.38X0.04=0.30X3 (gals) =0.9gal WELL DIAMETER (inches): (circle one) 2-inch or (1-inch)

Initial PID = NA

Purging PID = NA

TIME ~~pH~~	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: ~~1252~~	0	4.17	22.99	0.281	21.8	3.27	261	150 ( )	27.57
1257	0.2	4.30	22.90	0.273	15.3	2.60	259	150	27.68
1302	0.4	4.35	22.44	0.262	6.61	1.77	267	150	27.85
1307	0.6	4.34	22.18	0.261	1.70	1.78	273	150	28.02
1312	0.8	4.31	21.88	0.262	0.50	1.79	280	150	28.08
1317	1.0	4.32	21.78	0.263	0.0	1.73	282	150	28.14

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Overcast, Temp 80°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-5 DEPTH TO PRODUCT: NA DATE: 5/15/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1536

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 20.57 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 28

TOTAL DEPTH: 32.80 (ft btoc)

Arrived at: 1405 PURGE VOLUME: 12.23 X 0.04 = 0.49 x 3 (gals) = 1.50 WELL DIAMETER (inches): (circle one) 2-inch or (1-inch)

Initial PID = NA

Purging PID = NA

TIME 1500	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: ~~1440~~	0	3.96	21.94	0.474	21.7	7.56	304	200 ( )	21.34
1510 ~~1500~~ 1510	0.5	3.94	20.02	0.980	12.2	1.56	334	200	21.37
1515	0.75	3.98	19.49	1.00	9.98	1.25	349	200	21.38
1520	1.0	4.00	19.44	1.01	6.30	1.18	356	200	21.38
1525	1.25	4.00	19.46	1.01	4.47	1.09	367	200	21.38
1530	1.5	4.00	19.58	1.01	2.53	1.03	373	200	21.38
1535	1.75	4.01	19.67	1.00	1.80	1.00	377	200	21.38

COMMENTS: Batteries low on Horiba, Replaced batteries before starting readings

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Partly Cloudy, Temp 80°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-6 DEPTH TO PRODUCT: NA DATE: 5/16/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1218

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 22.69 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 35

TOTAL DEPTH: 40.14 (ft btoc)

Arrived at: 1045 PURGE VOLUME: 17.45 x 0.04 = 0.56 DH 0.7 x 3 (gals) 2.1 gal WELL DIAMETER (inches): (circle one) 2-inch or 1-inch

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1127	0	4.61	20.08	2.11	22.7	6.78	266	200 ( )	23.17
1137	0.5	4.54	19.91	1.87	7.16	5.54	270	200	23.17
1147	1.0	4.52	19.88	1.78	0.0	5.01	275	200	23.18
1152	1.25	4.51	19.52	1.74	0.0	4.82	279	200	23.18
1157	1.5	4.49	19.31	1.73	0.0	4.68	283	200	23.18
1202	1.75	4.50	19.34	1.72	0.0	4.42	286	200	23.18
1207	2.0	4.51	19.33	1.73	0.0	4.18	288	200	23.18
1212	2.25	4.50	19.43	1.74	0.0	4.10	291	200	23.18
1217	2.5	4.52	19.39	1.73	0.0	4.01	292	200	23.18

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION		
WEATHER:	Raining, Temp 70°F	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: Daniel Howard	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-7 DEPTH TO PRODUCT: NA DATE: 5/16/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1508

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 18.72 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 30

TOTAL DEPTH: 32.53 (ft btoc)

Arrived at: 1330 PURGE VOLUME: 13.81 x 0.04 = .55 x = 3 (gals) = 1.65 WELL DIAMETER (inches): (circle one)

Initial PID = NA 2-inch or (1-inch)

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1405	0	3.40	20.93	5.38	11.9	9.73	286	250 ( )	24.88
1415	0.10.24	3.54	20.94	5.36	5.49	3.71	274	100	26.15
1420	0.5.25	3.53	20.97	5.35	8.58	2.94	275	100	27.04
1425	0.6.50	3.55	21.11	5.44	4.43	2.12	263	100	27.31
1430	0.775	3.56	21.13	5.44	4.18	2.05	258	100	27.34
1435	0.90	3.61	21.17	5.39	3.46	1.90	250	100	27.34
1440	1.025	3.67	21.20	5.34	28.2	1.77	242	100	27.34
1445	1.250	3.69	21.20	5.30	41.4	1.68	235	150	27.34
1450	1.375	3.68	21.22	5.28	37.4	1.61	236	150	27.34
1455	1.4@1.55	3.68	21.27	5.26	25.9	1.54	239	150	27.32
1500	1.70	3.67	21.29	5.25	20.0	1.52	239	150	27.32
1505	1.85	3.67	21.34	5.22	9.84	1.49	243	150	27.32

COMMENTS: As water level dropped water got cloudy, Water cleared backup

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	12	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Raining, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-8 DEPTH TO PRODUCT: _____ DATE: 5-16-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 12:24

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: Dup-3 Time 1200 DEPTH TO WATER: 17.45 (ft btoc)

TOTAL DEPTH: 30.14 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 23

Arrived at: 11:00 PURGE VOLUME: 1.5 gal. (gals) 0.04x3x12.6=1.5

Initial PID = _____ WELL DIAMETER (inches): (circle one)

Purging PID = _____ 2-inch or (1-inch)

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 11:45		6.30	20.01	3.19	0.0	2.69	-80	200( )	
11:55	0.5	6.26	19.51	2.97	0.0	1.75	-88	200	17.76
12:05	1.0	6.23	18.37	2.83	0.0	1.57	-94	200	17.81
12:10	1.25	6.20	18.27	2.42	0.0	0.95	-100	200	17.87
12:15	1.5	6.19	18.26	2.36	0.0	0.85	-101	200	17.89
12:20	1.75	6.18	18.26	2.35	0.0	0.87	-101	200	17.86
12:24	Collected	sample	From TW-8						

COMMENTS: Dup-3 taken at this location for pesticides only
Heavy Rain
Lots of mosquitos

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Rain, 75°F, Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-9 DEPTH TO PRODUCT: _____ DATE: 5-16-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 16:24

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 18.60 (ft btoc)

TOTAL DEPTH: 35.17 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 23

Arrived at: 14:00 PURGE VOLUME: 2.0 (gals) 0.04 x 3 x 16.57 = 2.0

Initial PID = _____ WELL DIAMETER (inches): (circle one)

Purging PID = _____ 2-inch or (1-inch)

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 15:20		5.91	21.34	0.122	0.0	9.85	135	200 ( )	
15:35	0.5	5.49	19.49	0.367	0.0	4.59	145	200	19.21
15:45	1.0	5.38	18.43	0.430	0.0	3.18	146	200	19.35
15:55	1.5	5.47	18.48	0.433	0.0	1.21	139	200	19.51
16:00	1.75	5.45	18.50	0.435	0.0	0.86	139	200	19.63
16:07	2.0	5.45	18.49	0.436	0.0	0.77	138	200	19.64
16:12	2.25	5.46	18.50	0.436	0.0	0.74	137	200	19.61
16:16	2.5	5.47	18.49	0.436	0.0	0.71	135	200	19.59
16:21	2.75	5.47	18.49	0.436	0.0	0.70	134	200	19.59
16:24	Collected Sample From TW-9								

COMMENTS: Excessive vegetation around well including poison ivy
Lots of mosquitoes

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	3	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Rain, 75°F, Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	BEN RHINER	OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-10 DEPTH TO PRODUCT: _____ DATE: 5-17-18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 11:27

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 15.80 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 22

TOTAL DEPTH: 30.21 (ft btoc)

Arrived at: 10:15 PURGE VOLUME: 1.7 gal. (gals) 0.04×3×14.41= 1.7 WELL DIAMETER (inches): (circle one) 2-inch or (1-inch)

Initial PID = _____

Purging PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 10:50		3.57	20.74	0.795	86.7	7.69	218	200 ( )	
11:00	0.5	3.50	18.15	0.816	0.00	4.87	235	200	15.93
11:10	1.0	3.51	17.52	0.816	0.00	2.82	245	200	15.95
11:15	1.25	3.52	17.46	0.818	0.00	2.63	250	200	15.94
11:20	1.5	3.53	17.39	0.818	0.00	2.57	253	200	15.94
11:25	1.75								
11:27	Collected	sample	from	TW-10					

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
40 mL GL	82	HCL	8260	Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]

GENERAL INFORMATION			
WEATHER:	Cloudy 85°F Humid		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: BEN RHINER		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-11 DEPTH TO PRODUCT: NA DATE: 5/10/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1334

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: 29.05 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 40

TOTAL DEPTH: 45.11 (ft btoc)

Arrived at: 1105 PURGE VOLUME: 16.06 x 0.04 = 0.64 x 3 = 1.92 gal (gals) WELL DIAMETER (inches): (circle one) 2-inch or (1-inch)

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1212	0	4.55	24.62	0.174	318	6.84	218	100 ( )	29.82
1222	0.25	4.28	21.69	0.365	38.9	3.01	295	100	29.78
1232	0.5	4.24	21.13	0.371	13.7	2.65	328	100	29.78
1242	0.75	4.22	21.02	0.370	6.82	2.48	341	100	29.78
1252	1.0	4.20	20.87	0.371	2.74	2.31	358	100	29.78
1302	1.25	4.19	20.79	0.368	1.70	2.19	368	100	29.78
1312	1.5	4.20	20.86	0.371	1.10	2.13	372	100	29.78
1317	1.625	4.18	20.96	0.371	1.04	2.08	377	100	29.78
1322	1.75	4.18	21.10	0.371	0.90	2.06	379	100	29.78
1327	1.875	4.19	21.27	0.370	0.90	2.01	380	100	29.78
1332	2.0	4.19	21.40	0.369	0.93	1.99	381	100	29.78

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
~~40 mL GL~~	~~3~~	~~HGL~~	~~8260~~	~~Site Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]~~

GENERAL INFORMATION		
WEATHER:	Cloudy, Temp 75°F	
SHIPPED VIA:	FedEX or lab courier	
SHIPPED TO:	AES -Atlanta, GA	
SAMPLER: Daniel Howard		OBSERVER:

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

GROUNDWATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

WELL ID: TW-12 DEPTH TO PRODUCT: NA DATE: 5/9/18

PURGE METHOD: Low Flow/Low Stress :Pump TIME: 1350

SAMPLE METHOD: Pump per SESDPROC 301-R4 GRAB (x) COMPOSITE ( )

DUP./REP. OF: DEPTH TO WATER: 33.16 (ft btoc) >>>>>>>>> DEPTH TO PUMP INTAKE OR TUBING INTAKE (ft btoc): 40

TOTAL DEPTH: 45.12 (ft btoc)

Arrived at: 1120 PURGE VOLUME: 11.96 X 0.04 = 0.48 x 3 (gals) 1.44 WELL DIAMETER (inches): (circle one) 2-inch or (1-inch)

Initial PID = NA

Purging PID = NA

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1234	0	5.78	23.66	0.223	101	2.45	169	75 (ml)	
1244	0.2	6.02	21.91	0.197	69.9	1.77	73	75	34.38
1254	0.4	6.12	21.03	0.190	49.7	1.52	29	75	34.47
1304	0.6	6.14	20.80	0.191	51.3	1.53	29	75	34.48
1314	0.8	6.12	20.69	0.191	35.0	1.46	33	75	34.52
1324	1.0	6.11	20.60	0.192	24.6	1.43	33	75	34.52
1334	1.2	6.11	20.61	0.192	22.6	1.39	31	75	34.52
1339	1.3	6.12	20.53	0.192	17.1	1.37	30	75	34.52
1344	1.4	6.11	20.54	0.192	16.7	1.36	31	75	34.54
1349	1.5	6.13	20.51	0.191	15.9	1.32	29	75	34.54

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	Nitric acid	6020	Metals: Total Arsenic Lead Copper Zinc
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate
~~40 mL GL~~	~~3~~	~~HCL~~	~~8260~~	~~Site-Specific VOCs [See Sampling Scope of Work to confirm if well sampled for VOCs]~~ DL N

GENERAL INFORMATION			
WEATHER:	Clear, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Daniel Howard		OBSERVER:	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2010-5 DEPTH TO PRODUCT: — DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress : TIME: 1201

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: — DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: — _____

Arrived at: 1150 PURGE VOLUME: — WELL DIAMETER (inches):

Initial PID = —

Bailing PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1156		7.05	20.25	0.329	0.0	5.99	69	— ( )	—

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Partly Cloudy		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Ben Rhiner		OBSERVER: Daniel Howard	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2010-10 DEPTH TO PRODUCT: _____ DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress : TIME: 1144

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: _____ DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: _____ _____

Arrived at: 1130 PURGE VOLUME: _____ WELL DIAMETER (inches):

Initial PID = _____

Bailing PID = _____

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1140		7.22	20.27	0.329	7.44	6.73	99	— ( )	—
COMMENTS:									

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Partly Sunny, Temp 78°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Ben Rhiner		OBSERVER: Daniel Howard	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2012-11 DEPTH TO PRODUCT: —

DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress :

TIME: 1125

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER

GRAB (x) COMPOSITE ( )

DUP./REP. OF: DUP-5 Time 1200

DEPTH TO WATER: —

DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: —

Arrived at: 1115

PURGE VOLUME: —

WELL DIAMETER (inches):

Initial PID = —

Bailing PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1120		7.20	20.00	0.356	1.61	10.08	105	— ( )	—

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Partly Cloudy		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Ben Rhimer		OBSERVER: Daniel Howard	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2010-14 DEPTH TO PRODUCT: — DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress : TIME: 1025

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: — DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: — _____

Arrived at: 1017 PURGE VOLUME: — WELL DIAMETER (inches):

Initial PID = —

Bailing PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1020		7.14	19.94	0.380	0.0	9.24	79	— ( )	—
COMMENTS:									

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Overcast, Humid, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Ben Rhiner		OBSERVER: Daniel Howard	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2010-15 DEPTH TO PRODUCT: —

DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress :

TIME: 1010

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER

GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____

DEPTH TO WATER: —

DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: —

Arrived at: 1004

PURGE VOLUME: —

WELL DIAMETER (inches):

Initial PID = —

Balling PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1006		7.16	19.94	0.381	0.0	6.60	79	— ( )	—

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Overcast, Humid, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Ben Ahiner		OBSERVER: Daniel Howard	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2010-17 DEPTH TO PRODUCT: —

DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress :

TIME: 0955

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER

GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____

DEPTH TO WATER: —

DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: —

_____

Arrived at: 0950

PURGE VOLUME: —

WELL DIAMETER (inches):

Initial PID = —

Bailing PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 0953		6.79	19.81	0.376	0.10	7.92	99	— ( )	—

COMMENTS:

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Overcast, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER: Ben Rhinar		OBSERVER: Daniel Howard	

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2014-20 DEPTH TO PRODUCT: — DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress : TIME: 1100

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: — DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: — _____

Arrived at: 1053 PURGE VOLUME: — WELL DIAMETER (inches):

Initial PID = —

Bailing PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1055		6.83	19.19	0.569	0.0	10.67	98	— ( )	—
COMMENTS:									

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Overcast, Temp 75°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	Ben Rhiner	OBSERVER:	Daniel Howard

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

WATER FIELD SAMPLING REPORT

PROJECT NO: 6122-08-0154

Wood Environment & Infrastructure Solutions, Inc
1075 BIG SHANTY ROAD SUITE 100 KENNESAW GA 30144
PHONE: (770) 421-3400 / FAX: (770) 421-3486

LOCATION ID: SW-2014-21 DEPTH TO PRODUCT: — DATE: 5/18/18

PURGE METHOD: Low Flow/Low Stress : TIME: 1111

SAMPLE METHOD: Pump per SESDPROC 201-R3 SURFACE WATER GRAB (x) COMPOSITE ( )

DUP./REP. OF: _____ DEPTH TO WATER: — DEPTH TO PASSIVE DIFFUSION BAG (btoc)

TOTAL DEPTH: — _____

Arrived at: 1104 PURGE VOLUME: _____ WELL DIAMETER (inches):

Initial PID = —

Bailing PID = —

TIME	VOL. PURGED (gal)	pH	TEMPERATURE (°C)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO	ORP	Pump Rate ml/min. (& pump setting)	New Water Level
Initial: 1108		6.53	17.85	0.588	1.86	6.83	129	— ( )	—
COMMENTS:									

CONTAINER SIZE/TYPE	NO.	PRESERVATIVE	ANALYTICAL METHOD	ANALYSIS
500 mL PL	1	none	6020	Metals: DISSOLVED Arsenic Lead Copper Zinc
1 L GL Amber	2	none	8081A	Total organochlorine Pesticides
500 mL PL	1	none	9056	Nitrate and Sulfate

GENERAL INFORMATION			
WEATHER:	Partly Cloudy, Temp 78°F		
SHIPPED VIA:	FedEX or lab courier		
SHIPPED TO:	AES -Atlanta, GA		
SAMPLER:	Ben Rhiner	OBSERVER:	Daniel Howard

[0.163 x water column height (ft) x 3 (well volumes) for 2" wells]
[0.653 x water column height (ft) x 3 (well volumes) for 4" wells]

SOIL LABORATORY REPORTS

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

February 27, 2018

Rhonda Quinn
AMEC Foster Wheeler

1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL - Atlanta

Dear Rhonda Quinn: Order No: 1802E95

Analytical Environmental Services, Inc. received 57 samples on 2/15/2018 4:05:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar

Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive; Atlanta, GA 30340
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1802E95 ~~1800E04~~ SH 2/16/18

Date: 02/15/2018 Page 1 of 5

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Jodi Williams	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)							REMARKS	No # of Containers
							PRESERVATION (See codes)									
							I	I								
1	F3 (0-1) 021318	02/13/18	0922	X		SO	X	X								2
2	F4 (0-1) 021318	02/13/18	0935	X		SO	X	X								2
3	F5 (0-1) 021318	02/13/18	0948	X		SO	X	X								2
4	F6 (0-1) 021318	02/13/18	1006	X		SO	X	X								2
5	F7 (0-1) 021318	02/13/18	1028	X		SO	X	X								2
6	D9 (0-1) 021318	02/13/18	1036	X		SO	X	X								2
7	F8 (0-1) 021318	02/13/18	1038	X		SO	X	X								2
8	F9 (0-1) 021318	02/13/18	1050	X		SO	X	X								2
9	D8 (0-1) 021318	02/13/18	1056	X		SO	X	X								2
10	F10 (0-1) 021318	02/13/18	1102	X		SO	X	X								2
11	D7 (0-1) 021318	02/13/18	1121	X		SO	X	X								2
12	C7 (0-1) 021318	02/13/18	1133	X		SO	X	X								2
13	C6 (0-1) 021318	02/13/18	1151	X		SO	X	X								2
14	C5 (0-1) 021318	02/13/18	1212	X		SO	X	X								2

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/15/18 1515	1:	2/15/18 3:15
2:	2/15/18 4:05	2:	2/15/18 4:05PM
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD

OUT / / VIA:

IN / / VIA:

CLIENT FedEx UPS MAIL COURIER

GREYHOUND OTHER_____

PROJECT INFORMATION

PROJECT NAME:	BFEL - Atlanta
PROJECT #:	6122080154.27
SITE ADDRESS:	Atlanta, Georgia
SEND REPORT TO:	Greg Wrenn
COPY REPORT TO:	Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)	
QUOTE #:	PO#:

RECEIPT

Total # of Containers: 28

Turnaround Time Request

- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush **(auth req.)**
- ○ Other _____

STATE PROGRAM (if any): _____

E-mail? Y / N; Fax? Y / N

DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.

SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

1802E95 1802E94

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive; Atlanta, GA 30340
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1802E94

EH 2/16/18

Date: 02/15/2018 Page 2 of 5

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Jodi Williams	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)	Select Metals (6020)							No # of Containers
							PRESERVATION (See codes)									
							I	I	N+I							REMARKS
1	D5 (0-1) 021318	02/13/18	1215	X		SO	X	X								2
2	C4 (0-1) 021318	02/13/18	1229	X		SO	X	X								2
3	EB-01-021318	02/13/18	1240	X		W		X	X							3
4	F11 (0-1) 021318	02/13/18	1310	X		SO	X	X								2
5	F12 (0-1) 021318	02/13/18	1328	X		SO	X	X								2
6	F13 (0-1) 021318	02/13/18	1340	X		SO	X	X								2
7	F14 (0-1) 021318	02/13/18	1352	X		SO	X	X								2
8	F15 (0-1) 021318	02/13/18	1402	X		SO	X	X								2
9	D3 (0-1) 021318	02/13/18	1415	X		SO	X	X								2
10	F16 (0-1) 021318	02/13/18	1428	X		SO	X	X								2
11	D2 (0-1) 021318	02/13/18	1433	X		SO	X	X								2
12	C3 (0-1) 021318	02/13/18	1440	X		SO	X	X								2
13	F17 (0-1) 021318	02/13/18	1444	X		SO	X	X								2
14	D1 (0-1) 021318	02/13/18	1500	X		SO	X	X								2

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/15/18 1515	1:	2/15/18 3:15
2:	2/15/18 4:05	2:	2/15/18 4:05
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 29

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

1802E95

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive; Atlanta, GA 30340
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: ~~1802E94~~ EH 2/16/18

Date: 02/15/2018 Page 3 of 5

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Jodi Williams	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)	MS/MSD							No # of Containers
							PRESERVATION (See codes)									
							I	I	I							
1	E8 (0-1) 021318	02/13/18	1504	X		SO	X	X								2
2	E7 (0-1) 021318	02/13/18	1523	X		SO	X	X								2
3	E6 (0-1) 021318	02/13/18	1546	X		SO	X	X								2
4	E3 (0-1) 021318	02/13/18	1600	X		SO	X	X								2
5	E5 (0-1) 021318	02/13/18	1610	X		SO	X	X								2
6	E5 (0-1) 021318 MS/MSD	02/13/18	1610	X		SO			X							3
7	E2 (0-1) 021318	02/13/18	1613	X		SO	X	X								2
8	E4 (0-1) 021318	02/13/18	1636	X		SO	X	X								2
9	D6 (0-1) 021318	02/13/18	1651	X		SO	X	X								2
10	F18 (0-1) 021418	02/14/18	0915	X		SO	X	X								2
11	F19 (0-1) 021418	02/14/18	0930	X		SO	X	X								2
12	F20 (0-1) 021418	02/14/18	0944	X		SO	X	X								2
13	F20 (0-1) 021418 MS/MSD	02/14/18	0944	X		SO			X							2
14	F21 (0-1) 021418	02/14/18	0955	X		SO	X	X								2

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

REMARKS

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/15/18 1515	1:	2/15/18 3:15
2:	2/15/18 4:05	2:	2/15/18 4:05
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 29

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.

SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

1802E95

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive; Atlanta, GA 30340
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: ~~1802E99~~ SH 2/16/18

Date: 02/15/2018 Page 4 of 5

COMPANY: Wood

ADDRESS: 1075 Big Shanty Rd NW, Suite 100, Kennesaw, GA 30144

PHONE: 770-421-3400

FAX:

SAMPLED BY: Kenneth Nye, Daniel Howard

SIGNATURE: [signature]

ANALYSIS REQUESTED: Select Metals (6020); Select Organochlorine Pesticides (8081A); Select Metals (6020)

Visit our website **www.aesatlanta.com** to check on the status of your results, place bottle orders, etc.

#	SAMPLE ID	DATE	TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)	Select Metals (6020)							REMARKS	No # of Containers
						PRESERVATION (See codes)	I	I	N+I								
1	F22 (0-1) 021418	02/14/18	1005	X		SO	X	X									2
2	F23 (0-1) 021418	02/14/18	1027	X		SO	X	X									2
3	F24 (0-1) 021418	02/14/18	1041	X		SO	X	X									2
4	EB-02-021418	02/14/18	1050	X		W		X	X								3
5	F25 (0-1) 021418	02/14/18	1055	X		SO	X	X									2
6	F26 (0-1) 021418	02/14/18	1108	X		SO	X	X									2
7	F27 (0-1) 021418	02/14/18	1122	X		SO	X	X									2
8	F28 (0-1) 021418	02/14/18	1155	X		SO	X	X									2
9	D4 (0-1) 021418	02/14/18	1202	X		SO	X	X									2
10	F29 (0-1) 021418	02/14/18	1220	X		SO	X	X									2
11	F30 (0-1) 021418	02/14/18	1234	X		SO	X	X									2
12	F31 (0-1) 021418	02/14/18	1254	X		SO	X	X									2
13	E35 (0-1) 021418	02/14/18	1310	X		SO	X	X									2
14	E34 (0-1) 021418	02/14/18	1322	X		SO	X	X									2

RELINQUISHED BY / DATE/TIME	RECEIVED BY / DATE/TIME
1: [signature] 02/15/18 1515	1: [signature] 2/15/18 3:15
2: [signature] 2/15/18 4:05	2: [signature] 2/15/18 4:23
3:	3:

PROJECT INFORMATION

PROJECT NAME: BFEL - Atlanta

PROJECT #: 6122080154.27

SITE ADDRESS: Atlanta, Georgia

SEND REPORT TO: Greg Wrenn

COPY REPORT TO: Kenneth Nye, Rhonda Quinn

INVOICE TO: (IF DIFFERENT FROM ABOVE)

QUOTE #: PO#:

RECEIPT

Total # of Containers: 29

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other ____________

STATE PROGRAM (if any): ________

E-mail? Y / N; Fax? Y / N

DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER____________

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.

SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

1802E95

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive; Atlanta, GA 30340

TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: ~~1802E94~~ 1802E95 Ext 11/08/18

Date: 02/15/2018 Page 5 of 5

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)								No # of Containers
							PRESERVATION (See codes)									REMARKS
							I	I								
1	C10 (0-1) 021418	02/14/18	1338	X		SO	X	X								2
2	F32 (0-1) 021418	02/14/18	1342	X		SO	X	X								2
3	C9 (0-1) 021418	02/14/18	1425	X		SO	X	X								2
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/15/18 1515	1:	2/15/18 3:15
2:	2/15/18 4:05	2:	2/15/18 4:05
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD

OUT / / VIA:

IN / / VIA:

CLIENT FedEx UPS MAIL COURIER

GREYHOUND OTHER_____

PROJECT INFORMATION

PROJECT NAME:	BFEL - Atlanta
PROJECT #:	6122080154.27
SITE ADDRESS:	Atlanta, Georgia
SEND REPORT TO:	Greg Wrenn
COPY REPORT TO:	Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)	
QUOTE #:	PO#:

RECEIPT

Total # of Containers: 6

Turnaround Time Request

- (●) Standard 5 Business Days
- ( ) 2 Business Day Rush
- ( ) Next Business Day Rush
- ( ) Same Day Rush (auth req.)
- ( ) Other _____

STATE PROGRAM (if any): _____

E-mail? Y / N: Fax? Y / N

DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.

SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

Client: AMEC Foster Wheeler
Project: BFEL - Atlanta
Lab ID: 1802E95

Case Narrative

Sample Receiving Non-conformance:

Sample information on the Chain of Custody did not match that on the sample bottle labels for samples C10 (0-1) 021418 and C9 (0-1) 021418. Sample C10 (0-1) 021418 was listed as collected at 13:38PM on the Chain of Custody, whereas on the bottle labels it was listed as collected at 14:25PM. Sample C9 (0-1) 021418 was listed as collected at 14:25PM on the Chain of Custody, whereas on the bottle labels it was listed as collected at 13:38PM. Both samples were logged in according to the information on the Chain of Custody.

Pesticide Analysis by Method 8081B:

The MBLK (Method Blank) and LCS (Laboratory Control Sample) is reported in ug/kg on the Analytical QC Summary Report, while the final results, MS (Matrix Spike) and MSD (Matrix Spike Duplicate) are all reported in mg/kg-dry for Pesticide Analysis by Method 8081B.

Metals Analysis by Method 6020B:

The MBLK (Method Blank) and LCS (Laboratory Control Sample) is reported in ug/kg on the Analytical QC Summary Report, while the final results, MS (Matrix Spike) and MSD (Matrix Spike Duplicate) are all reported in mg/kg-dry for Metals Analysis by Method 6020B.

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F3 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 9:22:00 AM
Lab ID:	1802E95-001	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	2430	407		mg/Kg-dry	256073	50	02/22/2018 16:15	DP
Copper	514	5.42		mg/Kg-dry	256073	50	02/21/2018 15:14	DP
Lead	10100	2.71		mg/Kg-dry	256073	50	02/21/2018 15:14	DP
Zinc	573	27.1		mg/Kg-dry	256073	50	02/21/2018 15:14	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.25		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
4,4´-DDE	0.30	0.25		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
4,4´-DDT	2.6	0.25		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
alpha-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
alpha-Chlordane	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
beta-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
delta-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
Dieldrin	0.35	0.25		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
gamma-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
gamma-Chlordane	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
Heptachlor	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
Methoxychlor	BRL	1.2		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
Toxaphene	BRL	12		mg/Kg-dry	256093	50	02/20/2018 20:17	SH
Surr: Decachlorobiphenyl	200	45-128	S	%REC	256093	50	02/20/2018 20:17	SH
Surr: Tetrachloro-m-xylene	46.6	46-120		%REC	256093	50	02/20/2018 20:17	SH
PERCENT MOISTURE D2216								
Percent Moisture	33.0	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F4 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 9:50:00 AM
Lab ID:	1802E95-002	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	295	28.9		mg/Kg-dry	256073	50	02/21/2018 15:21	DP
Copper	249	5.78		mg/Kg-dry	256073	50	02/21/2018 15:21	DP
Lead	2460	2.89		mg/Kg-dry	256073	50	02/21/2018 15:21	DP
Zinc	405	28.9		mg/Kg-dry	256073	50	02/21/2018 15:21	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	15	2.6		mg/Kg-dry	256093	500	02/21/2018 11:05	RS
4,4´-DDE	5.9	0.26		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
4,4´-DDT	280	51		mg/Kg-dry	256093	10000	02/23/2018 15:40	SH
alpha-BHC	1.1	0.13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
alpha-Chlordane	BRL	0.13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
beta-BHC	99	26		mg/Kg-dry	256093	10000	02/23/2018 15:40	SH
delta-BHC	1.9	0.13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
Dieldrin	BRL	0.26		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
gamma-BHC	0.99	0.13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
gamma-Chlordane	BRL	0.13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
Heptachlor	BRL	0.13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
Methoxychlor	BRL	1.3		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
Toxaphene	BRL	13		mg/Kg-dry	256093	50	02/20/2018 20:28	SH
Surr: Decachlorobiphenyl	83.3	45-128		%REC	256093	50	02/20/2018 20:28	SH
Surr: Tetrachloro-m-xylene	65.3	46-120		%REC	256093	50	02/20/2018 20:28	SH
PERCENT MOISTURE D2216								
Percent Moisture	35.1	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F5 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 9:48:00 AM
Lab ID:	1802E95-003	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	158	26.2		mg/Kg-dry	256073	50	02/21/2018 15:46	DP
Copper	240	5.24		mg/Kg-dry	256073	50	02/21/2018 15:46	DP
Lead	2330	2.62		mg/Kg-dry	256073	50	02/21/2018 15:46	DP
Zinc	719	26.2		mg/Kg-dry	256073	50	02/21/2018 15:46	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.24		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
4,4´-DDE	0.75	0.24		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
4,4´-DDT	1.9	0.24		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
alpha-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
alpha-Chlordane	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
beta-BHC	0.29	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
delta-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
Dieldrin	BRL	0.24		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
gamma-BHC	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
gamma-Chlordane	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
Heptachlor	BRL	0.12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
Methoxychlor	BRL	1.2		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
Toxaphene	BRL	12		mg/Kg-dry	256093	50	02/20/2018 20:39	SH
Surr: Decachlorobiphenyl	140	45-128	S	%REC	256093	50	02/20/2018 20:39	SH
Surr: Tetrachloro-m-xylene	89.6	46-120		%REC	256093	50	02/20/2018 20:39	SH
PERCENT MOISTURE D2216								
Percent Moisture	31.4	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F6 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 10:06:00 AM
Lab ID:	1802E95-004	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	286	25.5		mg/Kg-dry	256073	50	02/21/2018 15:52	DP
Copper	549	5.10		mg/Kg-dry	256073	50	02/21/2018 15:52	DP
Lead	5550	2.55		mg/Kg-dry	256073	50	02/21/2018 15:52	DP
Zinc	717	25.5		mg/Kg-dry	256073	50	02/21/2018 15:52	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.072	0.046		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
4,4´-DDE	0.44	0.046		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
4,4´-DDT	2.3	0.46		mg/Kg-dry	256093	100	02/21/2018 11:53	RS
alpha-BHC	0.028	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
alpha-Chlordane	BRL	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
beta-BHC	0.17	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
delta-BHC	BRL	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
Dieldrin	0.18	0.046		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
gamma-BHC	BRL	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
gamma-Chlordane	BRL	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
Heptachlor	BRL	0.023		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
Methoxychlor	BRL	0.23		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
Toxaphene	BRL	2.3		mg/Kg-dry	256093	10	02/21/2018 00:23	SH
Surr: Decachlorobiphenyl	87.8	45-128		%REC	256093	10	02/21/2018 00:23	SH
Surr: Tetrachloro-m-xylene	87.6	46-120		%REC	256093	10	02/21/2018 00:23	SH
PERCENT MOISTURE D2216								
Percent Moisture	27.6	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F7 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 10:28:00 AM
Lab ID:	1802E95-005	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	345	23.6		mg/Kg-dry	256073	50	02/21/2018 15:58	DP
Copper	376	4.72		mg/Kg-dry	256073	50	02/21/2018 15:58	DP
Lead	5840	2.36		mg/Kg-dry	256073	50	02/21/2018 15:58	DP
Zinc	442	23.6		mg/Kg-dry	256073	50	02/21/2018 15:58	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.17	0.044		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
4,4´-DDE	2.2	0.44		mg/Kg-dry	256093	100	02/21/2018 12:09	RS
4,4´-DDT	5.8	0.44		mg/Kg-dry	256093	100	02/21/2018 12:09	RS
alpha-BHC	0.041	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
alpha-Chlordane	0.045	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
beta-BHC	0.13	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
delta-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
Dieldrin	6.1	0.44		mg/Kg-dry	256093	100	02/21/2018 12:09	RS
gamma-BHC	0.031	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
gamma-Chlordane	0.088	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
Heptachlor	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
Toxaphene	4.3	2.2		mg/Kg-dry	256093	10	02/21/2018 00:34	SH
Surr: Decachlorobiphenyl	90.2	45-128		%REC	256093	10	02/21/2018 00:34	SH
Surr: Tetrachloro-m-xylene	90.5	46-120		%REC	256093	10	02/21/2018 00:34	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.9	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D9 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 10:36:00 AM
Lab ID:	1802E95-006	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	105	24.5		mg/Kg-dry	256073	50	02/21/2018 16:05	DP
Copper	336	4.90		mg/Kg-dry	256073	50	02/21/2018 16:05	DP
Lead	1820	2.45		mg/Kg-dry	256073	50	02/21/2018 16:05	DP
Zinc	1160	24.5		mg/Kg-dry	256073	50	02/21/2018 16:05	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.23		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
4,4´-DDE	0.80	0.23		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
4,4´-DDT	4.4	0.23		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
beta-BHC	1.4	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
Dieldrin	0.27	0.23		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
Toxaphene	BRL	11		mg/Kg-dry	256093	50	02/20/2018 20:50	SH
Surr: Decachlorobiphenyl	117	45-128		%REC	256093	50	02/20/2018 20:50	SH
Surr: Tetrachloro-m-xylene	89.5	46-120		%REC	256093	50	02/20/2018 20:50	SH
PERCENT MOISTURE D2216								
Percent Moisture	27.2	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F8 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 10:38:00 AM
Lab ID:	1802E95-007	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	399	24.0		mg/Kg-dry	256073	50	02/21/2018 16:11	DP
Copper	1010	4.79		mg/Kg-dry	256073	50	02/21/2018 16:11	DP
Lead	15100	4.79		mg/Kg-dry	256073	100	02/21/2018 17:45	DP
Zinc	1530	24.0		mg/Kg-dry	256073	50	02/21/2018 16:11	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.043		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
4,4´-DDE	0.17	0.043		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
4,4´-DDT	0.41	0.043		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
alpha-Chlordane	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
beta-BHC	0.46	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
delta-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
Dieldrin	BRL	0.043		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
gamma-Chlordane	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
Heptachlor	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
Toxaphene	BRL	2.2		mg/Kg-dry	256093	10	02/21/2018 00:45	SH
Surr: Decachlorobiphenyl	89.3	45-128		%REC	256093	10	02/21/2018 00:45	SH
Surr: Tetrachloro-m-xylene	94.9	46-120		%REC	256093	10	02/21/2018 00:45	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.4	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F9 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 10:50:00 AM
Lab ID:	1802E95-008	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	296	23.6		mg/Kg-dry	256073	50	02/21/2018 16:17	DP
Copper	1270	4.71		mg/Kg-dry	256073	50	02/21/2018 16:17	DP
Lead	5550	2.36		mg/Kg-dry	256073	50	02/21/2018 16:17	DP
Zinc	1370	23.6		mg/Kg-dry	256073	50	02/21/2018 16:17	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.085		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
4,4´-DDE	0.41	0.085		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
4,4´-DDT	0.83	0.085		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
alpha-BHC	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
alpha-Chlordane	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
beta-BHC	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
delta-BHC	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
Dieldrin	BRL	0.085		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
gamma-BHC	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
gamma-Chlordane	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
Heptachlor	BRL	0.043		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
Methoxychlor	BRL	0.43		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
Toxaphene	BRL	4.3		mg/Kg-dry	256093	20	02/20/2018 21:57	SH
Surr: Decachlorobiphenyl	91.9	45-128		%REC	256093	20	02/20/2018 21:57	SH
Surr: Tetrachloro-m-xylene	73	46-120		%REC	256093	20	02/20/2018 21:57	SH
PERCENT MOISTURE D2216								
Percent Moisture	21.9	0		wt%	R363580	1	02/21/2018 13:00	AK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D8 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 10:56:00 AM
Lab ID:	1802E95-009	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	152	23.7		mg/Kg-dry	256073	50	02/21/2018 16:23	DP
Copper	784	4.73		mg/Kg-dry	256073	50	02/21/2018 16:23	DP
Lead	2610	2.37		mg/Kg-dry	256073	50	02/21/2018 16:23	DP
Zinc	3130	23.7		mg/Kg-dry	256073	50	02/21/2018 16:23	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.22		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
4,4´-DDE	0.67	0.22		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
4,4´-DDT	1.1	0.22		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
beta-BHC	0.15	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
Dieldrin	BRL	0.22		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
Toxaphene	BRL	11		mg/Kg-dry	256093	50	02/20/2018 21:01	SH
Surr: Decachlorobiphenyl	152	45-128	S	%REC	256093	50	02/20/2018 21:01	SH
Surr: Tetrachloro-m-xylene	85.6	46-120		%REC	256093	50	02/20/2018 21:01	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F10 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 11:02:00 AM
Lab ID:	1802E95-010	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	173	23.8		mg/Kg-dry	256073	50	02/21/2018 16:29	DP
Copper	646	4.77		mg/Kg-dry	256073	50	02/21/2018 16:29	DP
Lead	1420	2.38		mg/Kg-dry	256073	50	02/21/2018 16:29	DP
Zinc	764	23.8		mg/Kg-dry	256073	50	02/21/2018 16:29	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.21		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
4,4´-DDE	BRL	0.21		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
4,4´-DDT	BRL	0.21		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
beta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
Dieldrin	BRL	0.21		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
Toxaphene	BRL	11		mg/Kg-dry	256093	50	02/20/2018 21:12	SH
Surr: Decachlorobiphenyl	83	45-128		%REC	256093	50	02/20/2018 21:12	SH
Surr: Tetrachloro-m-xylene	113	46-120		%REC	256093	50	02/20/2018 21:12	SH
PERCENT MOISTURE D2216								
Percent Moisture	21.5	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D7 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 11:21:00 AM
Lab ID:	1802E95-011	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	74.4	22.5		mg/Kg-dry	256073	50	02/21/2018 16:36	DP
Copper	224	4.51		mg/Kg-dry	256073	50	02/21/2018 16:36	DP
Lead	737	2.25		mg/Kg-dry	256073	50	02/21/2018 16:36	DP
Zinc	403	22.5		mg/Kg-dry	256073	50	02/21/2018 16:36	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.088	0.083		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
4,4´-DDE	0.42	0.083		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
4,4´-DDT	1.5	0.083		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
alpha-BHC	0.076	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
alpha-Chlordane	BRL	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
beta-BHC	0.61	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
delta-BHC	BRL	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
Dieldrin	BRL	0.083		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
gamma-BHC	BRL	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
gamma-Chlordane	BRL	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
Heptachlor	BRL	0.042		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
Methoxychlor	BRL	0.42		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
Toxaphene	8.9	4.2		mg/Kg-dry	256093	20	02/20/2018 22:08	SH
Surr: Decachlorobiphenyl	95.6	45-128		%REC	256093	20	02/20/2018 22:08	SH
Surr: Tetrachloro-m-xylene	103	46-120		%REC	256093	20	02/20/2018 22:08	SH
PERCENT MOISTURE D2216								
Percent Moisture	19.8	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C7 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 11:33:00 AM
Lab ID:	1802E95-012	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	17.0	10.9		mg/Kg-dry	256073	50	02/21/2018 16:42	DP
Copper	48.2	5.07		mg/Kg-dry	256073	50	02/21/2018 16:42	DP
Lead	166	2.53		mg/Kg-dry	256073	50	02/21/2018 16:42	DP
Zinc	158	25.3		mg/Kg-dry	256073	50	02/21/2018 16:42	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.024		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
4,4´-DDE	0.074	0.024		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
4,4´-DDT	0.054	0.024		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
alpha-BHC	BRL	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
alpha-Chlordane	BRL	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
beta-BHC	0.015	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
delta-BHC	BRL	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
Dieldrin	BRL	0.024		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
gamma-BHC	BRL	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
gamma-Chlordane	BRL	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
Heptachlor	BRL	0.012		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
Methoxychlor	BRL	0.12		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
Toxaphene	BRL	1.2		mg/Kg-dry	256093	5	02/20/2018 20:06	SH
Surr: Decachlorobiphenyl	85.2	45-128		%REC	256093	5	02/20/2018 20:06	SH
Surr: Tetrachloro-m-xylene	80	46-120		%REC	256093	5	02/20/2018 20:06	SH
PERCENT MOISTURE D2216								
Percent Moisture	30.0	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C6 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 11:51:00 AM
Lab ID:	1802E95-013	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	232	24.0		mg/Kg-dry	256073	50	02/21/2018 17:07	DP
Copper	248	4.81		mg/Kg-dry	256073	50	02/21/2018 17:07	DP
Lead	45100	9.61		mg/Kg-dry	256073	200	02/21/2018 17:51	DP
Zinc	401	24.0		mg/Kg-dry	256073	50	02/21/2018 17:07	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.090		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
4,4´-DDE	0.22	0.090		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
4,4´-DDT	0.94	0.090		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
alpha-BHC	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
alpha-Chlordane	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
beta-BHC	0.16	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
delta-BHC	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
Dieldrin	BRL	0.090		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
gamma-BHC	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
gamma-Chlordane	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
Heptachlor	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
Methoxychlor	BRL	0.45		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
Toxaphene	BRL	4.5		mg/Kg-dry	256093	20	02/20/2018 22:19	SH
Surr: Decachlorobiphenyl	97.4	45-128		%REC	256093	20	02/20/2018 22:19	SH
Surr: Tetrachloro-m-xylene	91.8	46-120		%REC	256093	20	02/20/2018 22:19	SH
PERCENT MOISTURE D2216								
Percent Moisture	26.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C5 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 12:12:00 PM
Lab ID:	1802E95-014	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	175	25.3		mg/Kg-dry	256073	50	02/21/2018 17:13	DP
Copper	130	5.05		mg/Kg-dry	256073	50	02/21/2018 17:13	DP
Lead	957	2.53		mg/Kg-dry	256073	50	02/21/2018 17:13	DP
Zinc	601	25.3		mg/Kg-dry	256073	50	02/21/2018 17:13	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.36	0.22		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
4,4´-DDE	0.64	0.22		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
4,4´-DDT	5.8	0.22		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
alpha-Chlordane	0.22	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
beta-BHC	0.44	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
Dieldrin	0.63	0.22		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
gamma-Chlordane	0.20	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
Toxaphene	17	11		mg/Kg-dry	256093	50	02/20/2018 21:24	SH
Surr: Decachlorobiphenyl	99.3	45-128		%REC	256093	50	02/20/2018 21:24	SH
Surr: Tetrachloro-m-xylene	90.7	46-120		%REC	256093	50	02/20/2018 21:24	SH
PERCENT MOISTURE D2216								
Percent Moisture	25.6	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D5 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 12:15:00 PM
Lab ID:	1802E95-015	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	871	370		mg/Kg-dry	256073	50	02/22/2018 16:21	DP
Copper	1240	4.94		mg/Kg-dry	256073	50	02/21/2018 17:20	DP
Lead	7990	2.47		mg/Kg-dry	256073	50	02/21/2018 17:20	DP
Zinc	2310	24.7		mg/Kg-dry	256073	50	02/21/2018 17:20	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.043		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
4,4´-DDE	BRL	0.043		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
4,4´-DDT	BRL	0.043		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
alpha-Chlordane	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
beta-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
delta-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
Dieldrin	BRL	0.043		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
gamma-Chlordane	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
Heptachlor	BRL	0.022		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
Toxaphene	BRL	2.2		mg/Kg-dry	256093	10	02/21/2018 00:56	SH
Surr: Decachlorobiphenyl	73	45-128		%REC	256093	10	02/21/2018 00:56	SH
Surr: Tetrachloro-m-xylene	77.9	46-120		%REC	256093	10	02/21/2018 00:56	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.3	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C4 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 12:29:00 PM
Lab ID:	1802E95-016	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	10.2		mg/Kg-dry	256073	50	02/21/2018 17:26	DP
Copper	52.3	4.73		mg/Kg-dry	256073	50	02/21/2018 17:26	DP
Lead	59.1	2.36		mg/Kg-dry	256073	50	02/21/2018 17:26	DP
Zinc	96.5	23.6		mg/Kg-dry	256073	50	02/21/2018 17:26	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.46	0.22		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
4,4´-DDE	0.50	0.22		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
4,4´-DDT	4.1	0.22		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
alpha-Chlordane	0.14	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
beta-BHC	0.19	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
Dieldrin	2.1	0.22		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
gamma-BHC	0.13	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
gamma-Chlordane	0.16	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
Toxaphene	21	11		mg/Kg-dry	256093	50	02/20/2018 21:35	SH
Surr: Decachlorobiphenyl	110	45-128		%REC	256093	50	02/20/2018 21:35	SH
Surr: Tetrachloro-m-xylene	102	46-120		%REC	256093	50	02/20/2018 21:35	SH
PERCENT MOISTURE D2216								
Percent Moisture	24.6	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	EB-01-021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 12:40:00 PM
Lab ID:	1802E95-017	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	256070	1	02/22/2018 15:00	DP
Copper	BRL	0.00200		mg/L	256070	1	02/22/2018 15:00	DP
Lead	BRL	0.00100		mg/L	256070	1	02/22/2018 15:00	DP
Zinc	BRL	0.0100		mg/L	256070	1	02/22/2018 15:00	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	256091	1	02/21/2018 21:16	RS
4,4´-DDE	BRL	0.00010		mg/L	256091	1	02/21/2018 21:16	RS
4,4´-DDT	BRL	0.00010		mg/L	256091	1	02/21/2018 21:16	RS
alpha-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
alpha-Chlordane	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
beta-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
delta-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
Dieldrin	BRL	0.00010		mg/L	256091	1	02/21/2018 21:16	RS
gamma-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
gamma-Chlordane	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
Heptachlor	BRL	0.000050		mg/L	256091	1	02/21/2018 21:16	RS
Methoxychlor	BRL	0.00050		mg/L	256091	1	02/21/2018 21:16	RS
Toxaphene	BRL	0.0030		mg/L	256091	1	02/21/2018 21:16	RS
Surr: Decachlorobiphenyl	66	15.4-120		%REC	256091	1	02/21/2018 21:16	RS
Surr: Tetrachloro-m-xylene	77.7	37-126		%REC	256091	1	02/21/2018 21:16	RS

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F11 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 1:10:00 PM
Lab ID:	1802E95-018	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	39.1	24.7		mg/Kg-dry	256073	50	02/21/2018 17:32	DP
Copper	70.0	4.94		mg/Kg-dry	256073	50	02/21/2018 17:32	DP
Lead	344	2.47		mg/Kg-dry	256073	50	02/21/2018 17:32	DP
Zinc	194	24.7		mg/Kg-dry	256073	50	02/21/2018 17:32	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.12	0.087		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
4,4´-DDE	0.35	0.087		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
4,4´-DDT	4.8	0.87		mg/Kg-dry	256093	200	02/21/2018 11:37	RS
alpha-BHC	BRL	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
alpha-Chlordane	BRL	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
beta-BHC	0.047	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
delta-BHC	BRL	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
Dieldrin	0.48	0.087		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
gamma-BHC	BRL	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
gamma-Chlordane	BRL	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
Heptachlor	BRL	0.044		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
Methoxychlor	BRL	0.44		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
Toxaphene	BRL	4.4		mg/Kg-dry	256093	20	02/20/2018 22:31	SH
Surr: Decachlorobiphenyl	116	45-128		%REC	256093	20	02/20/2018 22:31	SH
Surr: Tetrachloro-m-xylene	88	46-120		%REC	256093	20	02/20/2018 22:31	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.6	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F12 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 1:28:00 PM
Lab ID:	1802E95-019	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	37.1	23.7		mg/Kg-dry	256073	50	02/21/2018 17:38	DP
Copper	257	4.74		mg/Kg-dry	256073	50	02/21/2018 17:38	DP
Lead	1350	2.37		mg/Kg-dry	256073	50	02/21/2018 17:38	DP
Zinc	583	23.7		mg/Kg-dry	256073	50	02/21/2018 17:38	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	2.5	0.22		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
4,4´-DDE	2.4	0.22		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
4,4´-DDT	7.9	0.43		mg/Kg-dry	256093	100	02/21/2018 11:21	RS
alpha-BHC	0.19	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
alpha-Chlordane	0.84	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
beta-BHC	1.0	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
Dieldrin	1.5	0.22		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
gamma-Chlordane	2.5	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
Toxaphene	BRL	11		mg/Kg-dry	256093	50	02/20/2018 21:46	SH
Surr: Decachlorobiphenyl	92.5	45-128		%REC	256093	50	02/20/2018 21:46	SH
Surr: Tetrachloro-m-xylene	101	46-120		%REC	256093	50	02/20/2018 21:46	SH
PERCENT MOISTURE D2216								
Percent Moisture	22.7	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F13 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 1:40:00 PM
Lab ID:	1802E95-020	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	308	291		mg/Kg-dry	256076	50	02/21/2018 20:44	DP
Copper	35.4	3.88		mg/Kg-dry	256076	50	02/21/2018 20:44	DP
Lead	161	1.94		mg/Kg-dry	256076	50	02/21/2018 20:44	DP
Zinc	133	19.4		mg/Kg-dry	256076	50	02/21/2018 20:44	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.41		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
4,4´-DDE	BRL	0.41		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
4,4´-DDT	0.97	0.41		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
alpha-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
alpha-Chlordane	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
beta-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
delta-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
Dieldrin	BRL	0.41		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
gamma-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
gamma-Chlordane	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
Heptachlor	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
Methoxychlor	BRL	2.0		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
Toxaphene	BRL	20		mg/Kg-dry	256094	100	02/22/2018 01:47	RS
Surr: Decachlorobiphenyl	110	45-128		%REC	256094	100	02/22/2018 01:47	RS
Surr: Tetrachloro-m-xylene	89.8	46-120		%REC	256094	100	02/22/2018 01:47	RS
PERCENT MOISTURE D2216								
Percent Moisture	18.5	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F14 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 1:52:00 PM
Lab ID:	1802E95-021	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	21.9	9.11		mg/Kg-dry	256076	50	02/21/2018 20:50	DP
Copper	41.5	4.56		mg/Kg-dry	256076	50	02/21/2018 20:50	DP
Lead	189	2.28		mg/Kg-dry	256076	50	02/21/2018 20:50	DP
Zinc	209	22.8		mg/Kg-dry	256076	50	02/21/2018 20:50	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.40		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
4,4´-DDE	0.84	0.40		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
4,4´-DDT	1.8	0.40		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
alpha-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
alpha-Chlordane	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
beta-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
delta-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
Dieldrin	BRL	0.40		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
gamma-BHC	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
gamma-Chlordane	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
Heptachlor	BRL	0.20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
Methoxychlor	BRL	2.0		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
Toxaphene	BRL	20		mg/Kg-dry	256094	100	02/22/2018 02:03	RS
Surr: Decachlorobiphenyl	114	45-128		%REC	256094	100	02/22/2018 02:03	RS
Surr: Tetrachloro-m-xylene	96	46-120		%REC	256094	100	02/22/2018 02:03	RS
PERCENT MOISTURE D2216								
Percent Moisture	16.7	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F15 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 2:02:00 PM
Lab ID:	1802E95-022	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	9.38	7.79		mg/Kg-dry	256076	50	02/21/2018 20:56	DP
Copper	34.4	5.19		mg/Kg-dry	256076	50	02/21/2018 20:56	DP
Lead	93.4	2.60		mg/Kg-dry	256076	50	02/21/2018 20:56	DP
Zinc	154	26.0		mg/Kg-dry	256076	50	02/21/2018 20:56	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.088		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
4,4´-DDE	0.55	0.088		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
4,4´-DDT	1.3	0.088		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
alpha-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
alpha-Chlordane	0.058	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
beta-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
delta-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
Dieldrin	0.100	0.088		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
gamma-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
gamma-Chlordane	0.082	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
Heptachlor	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
Methoxychlor	BRL	0.44		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
Toxaphene	BRL	4.4		mg/Kg-dry	256094	20	02/21/2018 22:51	RS
Surr: Decachlorobiphenyl	97.2	45-128		%REC	256094	20	02/21/2018 22:51	RS
Surr: Tetrachloro-m-xylene	69.2	46-120		%REC	256094	20	02/21/2018 22:51	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D3 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 2:15:00 PM
Lab ID:	1802E95-023	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	39.5	26.1		mg/Kg-dry	256076	50	02/21/2018 21:02	DP
Copper	107	5.21		mg/Kg-dry	256076	50	02/21/2018 21:02	DP
Lead	361	2.61		mg/Kg-dry	256076	50	02/21/2018 21:02	DP
Zinc	162	26.1		mg/Kg-dry	256076	50	02/21/2018 21:02	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.21		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
4,4´-DDE	BRL	0.21		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
4,4´-DDT	0.35	0.21		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
alpha-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
beta-BHC	0.49	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
delta-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
Dieldrin	BRL	0.21		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
gamma-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
gamma-Chlordane	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
Heptachlor	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
Methoxychlor	BRL	1.1		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
Toxaphene	BRL	11		mg/Kg-dry	256094	50	02/22/2018 03:07	RS
Surr: Decachlorobiphenyl	67	45-128		%REC	256094	50	02/22/2018 03:07	RS
Surr: Tetrachloro-m-xylene	47.4	46-120		%REC	256094	50	02/22/2018 03:07	RS
PERCENT MOISTURE D2216								
Percent Moisture	20.8	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F16 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 2:28:00 PM
Lab ID:	1802E95-024	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.33		mg/Kg-dry	256076	50	02/21/2018 21:09	DP
Copper	47.6	4.58		mg/Kg-dry	256076	50	02/21/2018 21:09	DP
Lead	99.5	2.29		mg/Kg-dry	256076	50	02/21/2018 21:09	DP
Zinc	104	22.9		mg/Kg-dry	256076	50	02/21/2018 21:09	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.088		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
4,4´-DDE	1.7	0.088		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
4,4´-DDT	2.1	0.088		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
alpha-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
alpha-Chlordane	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
beta-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
delta-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
Dieldrin	BRL	0.088		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
gamma-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
gamma-Chlordane	0.047	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
Heptachlor	BRL	0.044		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
Methoxychlor	BRL	0.44		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
Toxaphene	BRL	4.4		mg/Kg-dry	256094	20	02/21/2018 23:08	RS
Surr: Decachlorobiphenyl	122	45-128		%REC	256094	20	02/21/2018 23:08	RS
Surr: Tetrachloro-m-xylene	80.5	46-120		%REC	256094	20	02/21/2018 23:08	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.7	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D2 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 2:33:00 PM
Lab ID:	1802E95-025	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	29.9	23.4		mg/Kg-dry	256076	50	02/21/2018 21:15	DP
Copper	183	4.69		mg/Kg-dry	256076	50	02/21/2018 21:15	DP
Lead	299	2.34		mg/Kg-dry	256076	50	02/21/2018 21:15	DP
Zinc	491	23.4		mg/Kg-dry	256076	50	02/21/2018 21:15	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.094		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
4,4´-DDE	0.58	0.094		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
4,4´-DDT	1.5	0.094		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
alpha-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
alpha-Chlordane	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
beta-BHC	0.051	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
delta-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
Dieldrin	0.098	0.094		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
gamma-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
gamma-Chlordane	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
Heptachlor	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
Methoxychlor	BRL	0.47		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
Toxaphene	BRL	4.7		mg/Kg-dry	256094	20	02/22/2018 04:27	RS
Surr: Decachlorobiphenyl	84	45-128		%REC	256094	20	02/22/2018 04:27	RS
Surr: Tetrachloro-m-xylene	79.2	46-120		%REC	256094	20	02/22/2018 04:27	RS
PERCENT MOISTURE D2216								
Percent Moisture	28.9	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C3 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 2:40:00 PM
Lab ID:	1802E95-026	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	51.2	23.3		mg/Kg-dry	256076	50	02/21/2018 21:40	DP
Copper	159	4.66		mg/Kg-dry	256076	50	02/21/2018 21:40	DP
Lead	481	2.33		mg/Kg-dry	256076	50	02/21/2018 21:40	DP
Zinc	445	23.3		mg/Kg-dry	256076	50	02/21/2018 21:40	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.22		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
4,4´-DDE	1.0	0.22		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
4,4´-DDT	2.6	0.22		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
alpha-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
beta-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
delta-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
Dieldrin	BRL	0.22		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
gamma-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
gamma-Chlordane	0.13	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
Heptachlor	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
Methoxychlor	BRL	1.1		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
Toxaphene	BRL	11		mg/Kg-dry	256094	50	02/22/2018 03:23	RS
Surr: Decachlorobiphenyl	49.8	45-128		%REC	256094	50	02/22/2018 03:23	RS
Surr: Tetrachloro-m-xylene	41.1	46-120	S	%REC	256094	50	02/22/2018 03:23	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.1	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F17 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 2:44:00 PM
Lab ID:	1802E95-027	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	7.80	7.46		mg/Kg-dry	256076	50	02/21/2018 21:47	DP
Copper	34.0	4.69		mg/Kg-dry	256076	50	02/21/2018 21:47	DP
Lead	132	2.35		mg/Kg-dry	256076	50	02/21/2018 21:47	DP
Zinc	301	23.5		mg/Kg-dry	256076	50	02/21/2018 21:47	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.22		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
4,4´-DDE	0.33	0.22		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
4,4´-DDT	0.62	0.22		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
alpha-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
beta-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
delta-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
Dieldrin	BRL	0.22		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
gamma-BHC	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
gamma-Chlordane	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
Heptachlor	BRL	0.11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
Methoxychlor	BRL	1.1		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
Toxaphene	BRL	11		mg/Kg-dry	256094	50	02/22/2018 03:39	RS
Surr: Decachlorobiphenyl	53.9	45-128		%REC	256094	50	02/22/2018 03:39	RS
Surr: Tetrachloro-m-xylene	56.2	46-120		%REC	256094	50	02/22/2018 03:39	RS
PERCENT MOISTURE D2216								
Percent Moisture	22.9	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D1 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 3:00:00 PM
Lab ID:	1802E95-028	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	23.0	11.1		mg/Kg-dry	256076	50	02/21/2018 21:53	DP
Copper	149	4.93		mg/Kg-dry	256076	50	02/21/2018 21:53	DP
Lead	551	2.47		mg/Kg-dry	256076	50	02/21/2018 21:53	DP
Zinc	492	24.7		mg/Kg-dry	256076	50	02/21/2018 21:53	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.23		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
4,4´-DDE	0.38	0.23		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
4,4´-DDT	2.4	0.23		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
alpha-BHC	BRL	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
alpha-Chlordane	BRL	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
beta-BHC	0.22	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
delta-BHC	BRL	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
Dieldrin	BRL	0.23		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
gamma-BHC	BRL	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
gamma-Chlordane	BRL	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
Heptachlor	BRL	0.12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
Methoxychlor	BRL	1.2		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
Toxaphene	BRL	12		mg/Kg-dry	256094	50	02/22/2018 03:55	RS
Surr: Decachlorobiphenyl	165	45-128	S	%REC	256094	50	02/22/2018 03:55	RS
Surr: Tetrachloro-m-xylene	91.1	46-120		%REC	256094	50	02/22/2018 03:55	RS
PERCENT MOISTURE D2216								
Percent Moisture	28.4	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E8 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 3:04:00 PM
Lab ID:	1802E95-029	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	573	279		mg/Kg-dry	256076	50	02/22/2018 16:27	DP
Copper	656	3.71		mg/Kg-dry	256076	50	02/21/2018 21:59	DP
Lead	8850	1.86		mg/Kg-dry	256076	50	02/21/2018 21:59	DP
Zinc	835	18.6		mg/Kg-dry	256076	50	02/21/2018 21:59	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.25	0.042		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
4,4´-DDE	0.33	0.042		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
4,4´-DDT	12	0.42		mg/Kg-dry	256094	100	02/23/2018 15:51	SH
alpha-BHC	0.022	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
alpha-Chlordane	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
beta-BHC	0.17	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
delta-BHC	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
Dieldrin	0.10	0.042		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
gamma-BHC	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
gamma-Chlordane	0.045	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
Heptachlor	0.047	0.021		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
Methoxychlor	BRL	0.21		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
Toxaphene	2.2	2.1		mg/Kg-dry	256094	10	02/21/2018 23:39	RS
Surr: Decachlorobiphenyl	111	45-128		%REC	256094	10	02/21/2018 23:39	RS
Surr: Tetrachloro-m-xylene	77.6	46-120		%REC	256094	10	02/21/2018 23:39	RS
PERCENT MOISTURE D2216								
Percent Moisture	21.1	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E7 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 3:23:00 PM
Lab ID:	1802E95-030	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	115	33.1		mg/Kg-dry	256076	50	02/21/2018 22:05	DP
Copper	80.4	6.61		mg/Kg-dry	256076	50	02/21/2018 22:05	DP
Lead	1730	3.31		mg/Kg-dry	256076	50	02/21/2018 22:05	DP
Zinc	156	33.1		mg/Kg-dry	256076	50	02/21/2018 22:05	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.094		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
4,4´-DDE	0.50	0.094		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
4,4´-DDT	1.3	0.094		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
alpha-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
alpha-Chlordane	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
beta-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
delta-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
Dieldrin	0.10	0.094		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
gamma-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
gamma-Chlordane	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
Heptachlor	BRL	0.047		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
Methoxychlor	BRL	0.47		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
Toxaphene	BRL	4.7		mg/Kg-dry	256094	20	02/21/2018 23:23	RS
Surr: Decachlorobiphenyl	98	45-128		%REC	256094	20	02/21/2018 23:23	RS
Surr: Tetrachloro-m-xylene	75.2	46-120		%REC	256094	20	02/21/2018 23:23	RS
PERCENT MOISTURE D2216								
Percent Moisture	28.8	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E6 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 3:46:00 PM
Lab ID:	1802E95-031	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	120	31.7		mg/Kg-dry	256076	50	02/21/2018 22:12	DP
Copper	195	6.33		mg/Kg-dry	256076	50	02/21/2018 22:12	DP
Lead	1230	3.17		mg/Kg-dry	256076	50	02/21/2018 22:12	DP
Zinc	451	31.7		mg/Kg-dry	256076	50	02/21/2018 22:12	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.12	0.085		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
4,4´-DDE	0.63	0.085		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
4,4´-DDT	3.4	0.21		mg/Kg-dry	256094	50	02/23/2018 16:02	SH
alpha-BHC	BRL	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
alpha-Chlordane	0.047	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
beta-BHC	0.10	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
delta-BHC	BRL	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
Dieldrin	0.31	0.085		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
gamma-BHC	BRL	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
gamma-Chlordane	0.12	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
Heptachlor	BRL	0.043		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
Methoxychlor	BRL	0.43		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
Toxaphene	4.8	4.3		mg/Kg-dry	256094	20	02/22/2018 04:43	RS
Surr: Decachlorobiphenyl	48.1	45-128		%REC	256094	20	02/22/2018 04:43	RS
Surr: Tetrachloro-m-xylene	28	46-120	S	%REC	256094	20	02/22/2018 04:43	RS
PERCENT MOISTURE D2216								
Percent Moisture	22.0	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E3 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 4:00:00 PM
Lab ID:	1802E95-032	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	221	25.5		mg/Kg-dry	256076	50	02/21/2018 22:18	DP
Copper	380	5.10		mg/Kg-dry	256076	50	02/21/2018 22:18	DP
Lead	2460	2.55		mg/Kg-dry	256076	50	02/21/2018 22:18	DP
Zinc	753	25.5		mg/Kg-dry	256076	50	02/21/2018 22:18	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.095		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
4,4´-DDE	1.2	0.095		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
4,4´-DDT	2.1	0.095		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
alpha-BHC	0.091	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
alpha-Chlordane	0.100	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
beta-BHC	0.26	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
delta-BHC	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
Dieldrin	0.56	0.095		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
gamma-BHC	0.061	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
gamma-Chlordane	0.15	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
Heptachlor	BRL	0.047		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
Methoxychlor	BRL	0.47		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
Toxaphene	8.7	4.7		mg/Kg-dry	256094	20	02/22/2018 04:59	RS
Surr: Decachlorobiphenyl	57.3	45-128		%REC	256094	20	02/22/2018 04:59	RS
Surr: Tetrachloro-m-xylene	47.7	46-120		%REC	256094	20	02/22/2018 04:59	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.5	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E5 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 4:10:00 PM
Lab ID:	1802E95-033	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	196	24.5		mg/Kg-dry	256073	50	02/21/2018 14:43	DP
Copper	250	4.90		mg/Kg-dry	256073	50	02/21/2018 14:43	DP
Lead	2100	2.45		mg/Kg-dry	256073	50	02/21/2018 14:43	DP
Zinc	390	24.5		mg/Kg-dry	256073	50	02/21/2018 14:43	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.10	0.090		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
4,4´-DDE	1.3	0.090		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
4,4´-DDT	1.5	0.090		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
alpha-BHC	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
alpha-Chlordane	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
beta-BHC	0.42	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
delta-BHC	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
Dieldrin	0.21	0.090		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
gamma-BHC	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
gamma-Chlordane	0.055	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
Heptachlor	BRL	0.045		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
Methoxychlor	BRL	0.45		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
Toxaphene	8.4	4.5		mg/Kg-dry	256093	20	02/20/2018 22:42	SH
Surr: Decachlorobiphenyl	81.2	45-128		%REC	256093	20	02/20/2018 22:42	SH
Surr: Tetrachloro-m-xylene	77.5	46-120		%REC	256093	20	02/20/2018 22:42	SH
PERCENT MOISTURE D2216								
Percent Moisture	26.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E2 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 4:13:00 PM
Lab ID:	1802E95-034	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	109	30.7		mg/Kg-dry	256076	50	02/21/2018 22:24	DP
Copper	305	6.15		mg/Kg-dry	256076	50	02/21/2018 22:24	DP
Lead	1190	3.07		mg/Kg-dry	256076	50	02/21/2018 22:24	DP
Zinc	439	30.7		mg/Kg-dry	256076	50	02/21/2018 22:24	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.050		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
4,4´-DDE	0.12	0.050		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
4,4´-DDT	0.055	0.050		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
alpha-BHC	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
alpha-Chlordane	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
beta-BHC	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
delta-BHC	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
Dieldrin	BRL	0.050		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
gamma-BHC	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
gamma-Chlordane	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
Heptachlor	BRL	0.025		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
Methoxychlor	BRL	0.25		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
Toxaphene	BRL	2.5		mg/Kg-dry	256094	10	02/23/2018 16:47	SH
Surr: Decachlorobiphenyl	192	45-128	S	%REC	256094	10	02/23/2018 16:47	SH
Surr: Tetrachloro-m-xylene	76.7	46-120		%REC	256094	10	02/23/2018 16:47	SH
PERCENT MOISTURE D2216								
Percent Moisture	33.0	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E4 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 4:36:00 PM
Lab ID:	1802E95-035	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	154	24.7		mg/Kg-dry	256076	50	02/21/2018 22:30	DP
Copper	270	4.94		mg/Kg-dry	256076	50	02/21/2018 22:30	DP
Lead	1380	2.47		mg/Kg-dry	256076	50	02/21/2018 22:30	DP
Zinc	491	24.7		mg/Kg-dry	256076	50	02/21/2018 22:30	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.097		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
4,4´-DDE	0.35	0.097		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
4,4´-DDT	0.38	0.097		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
alpha-BHC	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
alpha-Chlordane	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
beta-BHC	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
delta-BHC	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
Dieldrin	BRL	0.097		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
gamma-BHC	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
gamma-Chlordane	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
Heptachlor	BRL	0.049		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
Methoxychlor	BRL	0.49		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
Toxaphene	BRL	4.9		mg/Kg-dry	256094	20	02/22/2018 05:15	RS
Surr: Decachlorobiphenyl	71.3	45-128		%REC	256094	20	02/22/2018 05:15	RS
Surr: Tetrachloro-m-xylene	62.3	46-120		%REC	256094	20	02/22/2018 05:15	RS
PERCENT MOISTURE D2216								
Percent Moisture	31.4	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D6 (0-1) 021318
Project Name:	BFEL - Atlanta	**Collection Date:**	2/13/2018 4:51:00 PM
Lab ID:	1802E95-036	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	13.4	9.63		mg/Kg-dry	256076	50	02/21/2018 22:37	DP
Copper	39.9	6.02		mg/Kg-dry	256076	50	02/21/2018 22:37	DP
Lead	107	3.01		mg/Kg-dry	256076	50	02/21/2018 22:37	DP
Zinc	124	30.1		mg/Kg-dry	256076	50	02/21/2018 22:37	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.11	0.042		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
4,4´-DDE	0.13	0.042		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
4,4´-DDT	0.84	0.042		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
alpha-BHC	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
alpha-Chlordane	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
beta-BHC	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
delta-BHC	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
Dieldrin	0.050	0.042		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
gamma-BHC	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
gamma-Chlordane	0.029	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
Heptachlor	BRL	0.021		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
Methoxychlor	BRL	0.21		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
Toxaphene	BRL	2.1		mg/Kg-dry	256094	10	02/21/2018 23:55	RS
Surr: Decachlorobiphenyl	54.9	45-128		%REC	256094	10	02/21/2018 23:55	RS
Surr: Tetrachloro-m-xylene	43.8	46-120	S	%REC	256094	10	02/21/2018 23:55	RS
PERCENT MOISTURE D2216								
Percent Moisture	19.9	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F18 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 9:15:00 AM
Lab ID:	1802E95-037	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.48		mg/Kg-dry	256076	50	02/21/2018 23:02	DP
Copper	34.2	5.46		mg/Kg-dry	256076	50	02/21/2018 23:02	DP
Lead	45.2	2.73		mg/Kg-dry	256076	50	02/21/2018 23:02	DP
Zinc	140	27.3		mg/Kg-dry	256076	50	02/21/2018 23:02	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.048		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
4,4´-DDE	BRL	0.048		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
4,4´-DDT	BRL	0.048		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
alpha-BHC	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
alpha-Chlordane	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
beta-BHC	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
delta-BHC	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
Dieldrin	BRL	0.048		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
gamma-BHC	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
gamma-Chlordane	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
Heptachlor	BRL	0.024		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
Methoxychlor	BRL	0.24		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
Toxaphene	BRL	2.4		mg/Kg-dry	256094	10	02/22/2018 00:11	RS
Surr: Decachlorobiphenyl	79.3	45-128		%REC	256094	10	02/22/2018 00:11	RS
Surr: Tetrachloro-m-xylene	71	46-120		%REC	256094	10	02/22/2018 00:11	RS
PERCENT MOISTURE D2216								
Percent Moisture	30.0	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F19 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 9:30:00 AM
Lab ID:	1802E95-038	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.43		mg/Kg-dry	256076	50	02/21/2018 23:08	DP
Copper	31.2	3.52		mg/Kg-dry	256076	50	02/21/2018 23:08	DP
Lead	37.1	1.76		mg/Kg-dry	256076	50	02/21/2018 23:08	DP
Zinc	106	17.6		mg/Kg-dry	256076	50	02/21/2018 23:08	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.084		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
4,4´-DDE	BRL	0.084		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
4,4´-DDT	0.30	0.084		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
alpha-BHC	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
alpha-Chlordane	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
beta-BHC	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
delta-BHC	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
Dieldrin	BRL	0.084		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
gamma-BHC	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
gamma-Chlordane	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
Heptachlor	BRL	0.042		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
Methoxychlor	BRL	0.42		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
Toxaphene	BRL	4.2		mg/Kg-dry	256094	20	02/23/2018 16:13	SH
Surr: Decachlorobiphenyl	80.9	45-128		%REC	256094	20	02/23/2018 16:13	SH
Surr: Tetrachloro-m-xylene	80.9	46-120		%REC	256094	20	02/23/2018 16:13	SH
PERCENT MOISTURE D2216								
Percent Moisture	20.8	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F20 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 9:44:00 AM
Lab ID:	1802E95-039	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.43		mg/Kg-dry	256076	50	02/21/2018 18:29	DP
Copper	52.9	4.22		mg/Kg-dry	256076	50	02/21/2018 18:29	DP
Lead	80.2	2.11		mg/Kg-dry	256076	50	02/21/2018 18:29	DP
Zinc	139	21.1		mg/Kg-dry	256076	50	02/21/2018 18:29	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.041		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
4,4´-DDE	BRL	0.041		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
4,4´-DDT	0.055	0.041		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
alpha-BHC	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
alpha-Chlordane	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
beta-BHC	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
delta-BHC	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
Dieldrin	BRL	0.041		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
gamma-BHC	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
gamma-Chlordane	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
Heptachlor	BRL	0.020		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
Methoxychlor	BRL	0.20		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
Toxaphene	BRL	2.0		mg/Kg-dry	256094	10	02/23/2018 16:35	SH
Surr: Decachlorobiphenyl	62.1	45-128		%REC	256094	10	02/23/2018 16:35	SH
Surr: Tetrachloro-m-xylene	61.4	46-120		%REC	256094	10	02/23/2018 16:35	SH
PERCENT MOISTURE D2216								
Percent Moisture	18.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F21 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 9:55:00 AM
Lab ID:	1802E95-040	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	18.8	9.90		mg/Kg-dry	256076	50	02/21/2018 23:14	DP
Copper	38.2	5.35		mg/Kg-dry	256076	50	02/21/2018 23:14	DP
Lead	146	2.67		mg/Kg-dry	256076	50	02/21/2018 23:14	DP
Zinc	351	26.7		mg/Kg-dry	256076	50	02/21/2018 23:14	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.087		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
4,4´-DDE	BRL	0.087		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
4,4´-DDT	BRL	0.087		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
alpha-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
alpha-Chlordane	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
beta-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
delta-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
Dieldrin	BRL	0.087		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
gamma-BHC	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
gamma-Chlordane	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
Heptachlor	BRL	0.044		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
Methoxychlor	BRL	0.44		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
Toxaphene	BRL	4.4		mg/Kg-dry	256094	20	02/23/2018 16:24	SH
Surr: Decachlorobiphenyl	109	45-128		%REC	256094	20	02/23/2018 16:24	SH
Surr: Tetrachloro-m-xylene	62.1	46-120		%REC	256094	20	02/23/2018 16:24	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.7	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F22 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 10:05:00 AM
Lab ID:	1802E95-041	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.46		mg/Kg-dry	256077	50	02/22/2018 00:24	DP
Copper	32.0	6.55		mg/Kg-dry	256077	50	02/22/2018 00:24	DP
Lead	189	3.27		mg/Kg-dry	256077	50	02/22/2018 00:24	DP
Zinc	700	32.7		mg/Kg-dry	256077	50	02/22/2018 00:24	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.49		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
4,4´-DDE	BRL	0.49		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
4,4´-DDT	0.63	0.49		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
alpha-BHC	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
alpha-Chlordane	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
beta-BHC	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
delta-BHC	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
Dieldrin	BRL	0.49		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
gamma-BHC	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
gamma-Chlordane	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
Heptachlor	BRL	0.25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
Methoxychlor	BRL	2.5		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
Toxaphene	BRL	25		mg/Kg-dry	256197	100	02/22/2018 22:33	SH
Surr: Decachlorobiphenyl	118	45-128		%REC	256197	100	02/22/2018 22:33	SH
Surr: Tetrachloro-m-xylene	88.6	46-120		%REC	256197	100	02/22/2018 22:33	SH
PERCENT MOISTURE D2216								
Percent Moisture	32.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F23 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 10:27:00 AM
Lab ID:	1802E95-042	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	8.38	7.48		mg/Kg-dry	256077	50	02/22/2018 00:30	DP
Copper	31.9	4.18		mg/Kg-dry	256077	50	02/22/2018 00:30	DP
Lead	183	2.09		mg/Kg-dry	256077	50	02/22/2018 00:30	DP
Zinc	609	20.9		mg/Kg-dry	256077	50	02/22/2018 00:30	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.22		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
4,4´-DDE	BRL	0.22		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
4,4´-DDT	0.76	0.22		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
beta-BHC	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
delta-BHC	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
Dieldrin	BRL	0.22		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
Heptachlor	BRL	0.11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
Toxaphene	BRL	11		mg/Kg-dry	256197	50	02/22/2018 21:37	SH
Surr: Decachlorobiphenyl	51.2	45-128		%REC	256197	50	02/22/2018 21:37	SH
Surr: Tetrachloro-m-xylene	78.1	46-120		%REC	256197	50	02/22/2018 21:37	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.9	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F24 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 10:41:00 AM
Lab ID:	1802E95-043	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.40		mg/Kg-dry	256077	50	02/22/2018 00:36	DP
Copper	33.8	4.87		mg/Kg-dry	256077	50	02/22/2018 00:36	DP
Lead	262	2.43		mg/Kg-dry	256077	50	02/22/2018 00:36	DP
Zinc	894	24.3		mg/Kg-dry	256077	50	02/22/2018 00:36	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.044		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
4,4´-DDE	0.069	0.044		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
4,4´-DDT	0.14	0.044		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
alpha-Chlordane	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
beta-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
delta-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
Dieldrin	BRL	0.044		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
gamma-Chlordane	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
Heptachlor	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
Toxaphene	BRL	2.2		mg/Kg-dry	256197	10	02/22/2018 20:19	SH
Surr: Decachlorobiphenyl	108	45-128		%REC	256197	10	02/22/2018 20:19	SH
Surr: Tetrachloro-m-xylene	22.4	46-120	S	%REC	256197	10	02/22/2018 20:19	SH
PERCENT MOISTURE D2216								
Percent Moisture	24.1	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	EB-02-021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 10:50:00 AM
Lab ID:	1802E95-044	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Total Metals by ICP/MS SW6020B				**(SW3005A)**				
Arsenic	BRL	0.00500		mg/L	256070	1	02/22/2018 15:50	DP
Copper	BRL	0.00200		mg/L	256070	1	02/22/2018 15:50	DP
Lead	BRL	0.00100		mg/L	256070	1	02/22/2018 15:50	DP
Zinc	BRL	0.0100		mg/L	256070	1	02/22/2018 15:50	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3510C)**				
4,4´-DDD	BRL	0.00010		mg/L	256091	1	02/21/2018 22:04	RS
4,4´-DDE	BRL	0.00010		mg/L	256091	1	02/21/2018 22:04	RS
4,4´-DDT	BRL	0.00010		mg/L	256091	1	02/21/2018 22:04	RS
alpha-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
alpha-Chlordane	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
beta-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
delta-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
Dieldrin	BRL	0.00010		mg/L	256091	1	02/21/2018 22:04	RS
gamma-BHC	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
gamma-Chlordane	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
Heptachlor	BRL	0.000050		mg/L	256091	1	02/21/2018 22:04	RS
Methoxychlor	BRL	0.00050		mg/L	256091	1	02/21/2018 22:04	RS
Toxaphene	BRL	0.0030		mg/L	256091	1	02/21/2018 22:04	RS
Surr: Decachlorobiphenyl	46.1	15.4-120		%REC	256091	1	02/21/2018 22:04	RS
Surr: Tetrachloro-m-xylene	60.8	37-126		%REC	256091	1	02/21/2018 22:04	RS

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F25 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 10:55:00 AM
Lab ID:	1802E95-045	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	61.4	17.4		mg/Kg-dry	256077	50	02/22/2018 00:43	DP
Copper	77.0	3.49		mg/Kg-dry	256077	50	02/22/2018 00:43	DP
Lead	2610	1.74		mg/Kg-dry	256077	50	02/22/2018 00:43	DP
Zinc	669	17.4		mg/Kg-dry	256077	50	02/22/2018 00:43	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.046		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
4,4´-DDE	BRL	0.046		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
4,4´-DDT	BRL	0.046		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
alpha-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
alpha-Chlordane	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
beta-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
delta-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
Dieldrin	BRL	0.046		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
gamma-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
gamma-Chlordane	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
Heptachlor	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
Methoxychlor	BRL	0.23		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
Toxaphene	BRL	2.3		mg/Kg-dry	256197	10	02/22/2018 20:30	SH
Surr: Decachlorobiphenyl	107	45-128		%REC	256197	10	02/22/2018 20:30	SH
Surr: Tetrachloro-m-xylene	79.2	46-120		%REC	256197	10	02/22/2018 20:30	SH
PERCENT MOISTURE D2216								
Percent Moisture	27.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F26 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 11:08:00 AM
Lab ID:	1802E95-046	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	120	18.7		mg/Kg-dry	256077	50	02/22/2018 00:49	DP
Copper	48.9	3.74		mg/Kg-dry	256077	50	02/22/2018 00:49	DP
Lead	5310	1.87		mg/Kg-dry	256077	50	02/22/2018 00:49	DP
Zinc	193	18.7		mg/Kg-dry	256077	50	02/22/2018 00:49	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.044		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
4,4´-DDE	0.064	0.044		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
4,4´-DDT	0.064	0.044		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
alpha-Chlordane	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
beta-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
delta-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
Dieldrin	BRL	0.044		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
gamma-Chlordane	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
Heptachlor	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
Toxaphene	BRL	2.2		mg/Kg-dry	256197	10	02/22/2018 20:41	SH
Surr: Decachlorobiphenyl	118	45-128		%REC	256197	10	02/22/2018 20:41	SH
Surr: Tetrachloro-m-xylene	70.7	46-120		%REC	256197	10	02/22/2018 20:41	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.5	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F27 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 11:22:00 AM
Lab ID:	1802E95-047	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	16.8	10.5		mg/Kg-dry	256077	50	02/22/2018 00:55	DP
Copper	24.3	4.65		mg/Kg-dry	256077	50	02/22/2018 00:55	DP
Lead	327	2.32		mg/Kg-dry	256077	50	02/22/2018 00:55	DP
Zinc	364	23.2		mg/Kg-dry	256077	50	02/22/2018 00:55	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.042		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
4,4´-DDE	BRL	0.042		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
4,4´-DDT	BRL	0.042		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
alpha-BHC	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
alpha-Chlordane	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
beta-BHC	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
delta-BHC	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
Dieldrin	BRL	0.042		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
gamma-BHC	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
gamma-Chlordane	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
Heptachlor	BRL	0.021		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
Methoxychlor	BRL	0.21		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
Toxaphene	BRL	2.1		mg/Kg-dry	256197	10	02/23/2018 16:58	SH
Surr: Decachlorobiphenyl	196	45-128	S	%REC	256197	10	02/23/2018 16:58	SH
Surr: Tetrachloro-m-xylene	71.8	46-120		%REC	256197	10	02/23/2018 16:58	SH
PERCENT MOISTURE D2216								
Percent Moisture	21.3	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F28 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 11:55:00 AM
Lab ID:	1802E95-048	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	60.1	22.3		mg/Kg-dry	256077	50	02/22/2018 01:01	DP
Copper	43.8	4.46		mg/Kg-dry	256077	50	02/22/2018 01:01	DP
Lead	1890	2.23		mg/Kg-dry	256077	50	02/22/2018 01:01	DP
Zinc	780	22.3		mg/Kg-dry	256077	50	02/22/2018 01:01	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.045		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
4,4´-DDE	BRL	0.045		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
4,4´-DDT	BRL	0.045		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
alpha-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
alpha-Chlordane	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
beta-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
delta-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
Dieldrin	BRL	0.045		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
gamma-BHC	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
gamma-Chlordane	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
Heptachlor	BRL	0.023		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
Methoxychlor	BRL	0.23		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
Toxaphene	BRL	2.3		mg/Kg-dry	256197	10	02/22/2018 20:53	SH
Surr: Decachlorobiphenyl	105	45-128		%REC	256197	10	02/22/2018 20:53	SH
Surr: Tetrachloro-m-xylene	89.3	46-120		%REC	256197	10	02/22/2018 20:53	SH
PERCENT MOISTURE D2216								
Percent Moisture	25.9	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D4 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 12:02:00 PM
Lab ID:	1802E95-049	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	664	511		mg/Kg-dry	256077	100	02/22/2018 14:28	DP
Copper	1790	3.40		mg/Kg-dry	256077	50	02/22/2018 01:08	DP
Lead	7080	1.70		mg/Kg-dry	256077	50	02/22/2018 01:08	DP
Zinc	2680	17.0		mg/Kg-dry	256077	50	02/22/2018 01:08	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.038		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
4,4´-DDE	BRL	0.038		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
4,4´-DDT	BRL	0.038		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
alpha-BHC	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
alpha-Chlordane	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
beta-BHC	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
delta-BHC	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
Dieldrin	BRL	0.038		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
gamma-BHC	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
gamma-Chlordane	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
Heptachlor	BRL	0.019		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
Methoxychlor	BRL	0.19		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
Toxaphene	BRL	1.9		mg/Kg-dry	256197	10	02/23/2018 17:09	SH
Surr: Decachlorobiphenyl	118	45-128		%REC	256197	10	02/23/2018 17:09	SH
Surr: Tetrachloro-m-xylene	64.9	46-120		%REC	256197	10	02/23/2018 17:09	SH
PERCENT MOISTURE D2216								
Percent Moisture	13.4	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F29 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 12:20:00 PM
Lab ID:	1802E95-050	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	19.2	12.2		mg/Kg-dry	256077	50	02/22/2018 01:14	DP
Copper	48.0	4.06		mg/Kg-dry	256077	50	02/22/2018 01:14	DP
Lead	344	2.03		mg/Kg-dry	256077	50	02/22/2018 01:14	DP
Zinc	588	20.3		mg/Kg-dry	256077	50	02/22/2018 01:14	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.77	0.26		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
4,4´-DDE	0.71	0.26		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
4,4´-DDT	17	2.6		mg/Kg-dry	256197	500	02/23/2018 14:04	SH
alpha-BHC	BRL	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
alpha-Chlordane	0.60	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
beta-BHC	0.38	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
delta-BHC	BRL	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
Dieldrin	15	2.6		mg/Kg-dry	256197	500	02/23/2018 14:04	SH
gamma-BHC	BRL	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
gamma-Chlordane	0.56	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
Heptachlor	0.37	0.13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
Methoxychlor	BRL	1.3		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
Toxaphene	BRL	13		mg/Kg-dry	256197	50	02/22/2018 22:11	SH
Surr: Decachlorobiphenyl	126	45-128		%REC	256197	50	02/22/2018 22:11	SH
Surr: Tetrachloro-m-xylene	75	46-120		%REC	256197	50	02/22/2018 22:11	SH
PERCENT MOISTURE D2216								
Percent Moisture	34.8	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F30 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 12:34:00 PM
Lab ID:	1802E95-051	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.46		mg/Kg-dry	256077	50	02/22/2018 01:20	DP
Copper	19.9	5.53		mg/Kg-dry	256077	50	02/22/2018 01:20	DP
Lead	46.5	2.76		mg/Kg-dry	256077	50	02/22/2018 01:20	DP
Zinc	97.0	27.6		mg/Kg-dry	256077	50	02/22/2018 01:20	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0046		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
4,4´-DDE	BRL	0.0046		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
4,4´-DDT	BRL	0.0046		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
alpha-BHC	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
alpha-Chlordane	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
beta-BHC	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
delta-BHC	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
Dieldrin	BRL	0.0046		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
gamma-BHC	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
gamma-Chlordane	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
Heptachlor	BRL	0.0023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
Methoxychlor	BRL	0.023		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
Toxaphene	BRL	0.23		mg/Kg-dry	256197	1	02/23/2018 13:20	SH
Surr: Decachlorobiphenyl	76.7	45-128		%REC	256197	1	02/23/2018 13:20	SH
Surr: Tetrachloro-m-xylene	65.9	46-120		%REC	256197	1	02/23/2018 13:20	SH
PERCENT MOISTURE D2216								
Percent Moisture	28.0	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F31 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 12:54:00 PM
Lab ID:	1802E95-052	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	27.6	21.7		mg/Kg-dry	256077	50	02/22/2018 01:45	DP
Copper	37.2	4.35		mg/Kg-dry	256077	50	02/22/2018 01:45	DP
Lead	238	2.17		mg/Kg-dry	256077	50	02/22/2018 01:45	DP
Zinc	147	21.7		mg/Kg-dry	256077	50	02/22/2018 01:45	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	4.5		mg/Kg-dry	256197	1000	02/23/2018 13:31	SH
4,4´-DDE	0.72	0.045		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
4,4´-DDT	82	4.5		mg/Kg-dry	256197	1000	02/23/2018 13:31	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
alpha-Chlordane	0.078	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
beta-BHC	0.46	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
delta-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
Dieldrin	1.1	0.045		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
gamma-Chlordane	0.22	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
Heptachlor	0.17	0.022		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256197	10	02/22/2018 21:04	SH
Toxaphene	BRL	220		mg/Kg-dry	256197	1000	02/23/2018 13:31	SH
Surr: Decachlorobiphenyl	91.2	45-128		%REC	256197	10	02/22/2018 21:04	SH
Surr: Tetrachloro-m-xylene	71.8	46-120		%REC	256197	10	02/22/2018 21:04	SH
PERCENT MOISTURE D2216								
Percent Moisture	25.8	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E35 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 1:10:00 PM
Lab ID:	1802E95-053	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.50		mg/Kg-dry	256077	50	02/22/2018 01:52	DP
Copper	11.0	3.77		mg/Kg-dry	256077	50	02/22/2018 01:52	DP
Lead	33.7	1.88		mg/Kg-dry	256077	50	02/22/2018 01:52	DP
Zinc	33.9	18.8		mg/Kg-dry	256077	50	02/22/2018 01:52	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0041		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
4,4´-DDE	BRL	0.0041		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
4,4´-DDT	BRL	0.0041		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
alpha-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
alpha-Chlordane	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
beta-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
delta-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
Dieldrin	BRL	0.0041		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
gamma-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
gamma-Chlordane	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
Heptachlor	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
Methoxychlor	BRL	0.021		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
Toxaphene	BRL	0.21		mg/Kg-dry	256197	1	02/23/2018 12:57	SH
Surr: Decachlorobiphenyl	71.3	45-128		%REC	256197	1	02/23/2018 12:57	SH
Surr: Tetrachloro-m-xylene	60.6	46-120		%REC	256197	1	02/23/2018 12:57	SH
PERCENT MOISTURE D2216								
Percent Moisture	19.0	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E34 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 1:22:00 PM
Lab ID:	1802E95-054	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.47		mg/Kg-dry	256077	50	02/22/2018 01:58	DP
Copper	13.3	3.77		mg/Kg-dry	256077	50	02/22/2018 01:58	DP
Lead	67.3	1.89		mg/Kg-dry	256077	50	02/22/2018 01:58	DP
Zinc	46.1	18.9		mg/Kg-dry	256077	50	02/22/2018 01:58	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0042		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
4,4´-DDE	0.0074	0.0042		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
4,4´-DDT	BRL	0.0042		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
alpha-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
alpha-Chlordane	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
beta-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
delta-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
Dieldrin	BRL	0.0042		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
gamma-BHC	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
gamma-Chlordane	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
Heptachlor	BRL	0.0021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
Methoxychlor	BRL	0.021		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
Toxaphene	BRL	0.21		mg/Kg-dry	256197	1	02/23/2018 13:09	SH
Surr: Decachlorobiphenyl	92.8	45-128		%REC	256197	1	02/23/2018 13:09	SH
Surr: Tetrachloro-m-xylene	76.3	46-120		%REC	256197	1	02/23/2018 13:09	SH
PERCENT MOISTURE D2216								
Percent Moisture	20.9	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C10 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 1:38:00 PM
Lab ID:	1802E95-055	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	11.3	9.52		mg/Kg-dry	256077	50	02/22/2018 02:04	DP
Copper	27.1	3.81		mg/Kg-dry	256077	50	02/22/2018 02:04	DP
Lead	69.2	1.90		mg/Kg-dry	256077	50	02/22/2018 02:04	DP
Zinc	94.5	19.0		mg/Kg-dry	256077	50	02/22/2018 02:04	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.23	0.19		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
4,4´-DDE	1.1	0.19		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
4,4´-DDT	2.6	0.19		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
alpha-BHC	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
alpha-Chlordane	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
beta-BHC	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
delta-BHC	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
Dieldrin	BRL	0.19		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
gamma-BHC	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
gamma-Chlordane	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
Heptachlor	BRL	0.095		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
Methoxychlor	BRL	0.95		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
Toxaphene	BRL	9.5		mg/Kg-dry	256197	50	02/22/2018 22:22	SH
Surr: Decachlorobiphenyl	80.4	45-128		%REC	256197	50	02/22/2018 22:22	SH
Surr: Tetrachloro-m-xylene	79.8	46-120		%REC	256197	50	02/22/2018 22:22	SH
PERCENT MOISTURE D2216								
Percent Moisture	12.1	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	F32 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 1:42:00 PM
Lab ID:	1802E95-056	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	13.8	9.79		mg/Kg-dry	256077	50	02/22/2018 02:11	DP
Copper	39.5	3.91		mg/Kg-dry	256077	50	02/22/2018 02:11	DP
Lead	136	1.96		mg/Kg-dry	256077	50	02/22/2018 02:11	DP
Zinc	135	19.6		mg/Kg-dry	256077	50	02/22/2018 02:11	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.27	0.043		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
4,4´-DDE	0.18	0.043		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
4,4´-DDT	6.5	2.2		mg/Kg-dry	256197	500	02/23/2018 13:42	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
alpha-Chlordane	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
beta-BHC	0.094	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
delta-BHC	0.024	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
Dieldrin	0.15	0.043		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
gamma-Chlordane	0.035	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
Heptachlor	BRL	0.022		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
Toxaphene	BRL	2.2		mg/Kg-dry	256197	10	02/22/2018 21:15	SH
Surr: Decachlorobiphenyl	126	45-128		%REC	256197	10	02/22/2018 21:15	SH
Surr: Tetrachloro-m-xylene	96.9	46-120		%REC	256197	10	02/22/2018 21:15	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.1	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 27-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C9 (0-1) 021418
Project Name:	BFEL - Atlanta	**Collection Date:**	2/14/2018 2:25:00 PM
Lab ID:	1802E95-057	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	24.6	21.5		mg/Kg-dry	256077	50	02/21/2018 23:33	DP
Copper	81.3	7.17		mg/Kg-dry	256077	50	02/21/2018 23:33	DP
Lead	301	3.58		mg/Kg-dry	256077	50	02/21/2018 23:33	DP
Zinc	359	35.8		mg/Kg-dry	256077	50	02/21/2018 23:33	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.23	0.057		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
4,4´-DDE	0.82	0.057		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
4,4´-DDT	4.1	0.57		mg/Kg-dry	256197	100	02/23/2018 13:53	SH
alpha-BHC	0.16	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
alpha-Chlordane	0.037	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
beta-BHC	0.31	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
delta-BHC	BRL	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
Dieldrin	0.36	0.057		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
gamma-BHC	0.11	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
gamma-Chlordane	0.065	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
Heptachlor	BRL	0.028		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
Methoxychlor	BRL	0.28		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
Toxaphene	4.5	2.8		mg/Kg-dry	256197	10	02/22/2018 21:26	SH
Surr: Decachlorobiphenyl	144	45-128	S	%REC	256197	10	02/22/2018 21:26	SH
Surr: Tetrachloro-m-xylene	49.9	46-120		%REC	256197	10	02/22/2018 21:26	SH
PERCENT MOISTURE D2216								
Percent Moisture	41.2	0		wt%	R363742	1	02/22/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 27-Feb-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F3 (0-1) 021318				**Lab ID:** 1802E95-001			
Collection Date: 2/13/2018 9:22:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	2430		2.34	407	mg/Kg-dry	256073	50
Copper	514		2.76	5.42	mg/Kg-dry	256073	50
Lead	10100		1.56	2.71	mg/Kg-dry	256073	50
Zinc	573		2.71	27.1	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.30		0.058	0.25	mg/Kg-dry	256093	50
4,4´-DDT	2.6		0.056	0.25	mg/Kg-dry	256093	50
Dieldrin	0.35		0.052	0.25	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	33.0		0	0	wt%	R363580	1
Client Sample ID: F4 (0-1) 021318				**Lab ID:** 1802E95-002			
Collection Date: 2/13/2018 9:50:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	295		2.49	28.9	mg/Kg-dry	256073	50
Copper	249		2.94	5.78	mg/Kg-dry	256073	50
Lead	2460		1.66	2.89	mg/Kg-dry	256073	50
Zinc	405		2.89	28.9	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	15		0.50	2.6	mg/Kg-dry	256093	500
4,4´-DDE	5.9		0.060	0.26	mg/Kg-dry	256093	50
4,4´-DDT	280		12	51	mg/Kg-dry	256093	10000
alpha-BHC	1.1		0.062	0.13	mg/Kg-dry	256093	50
beta-BHC	99		8.2	26	mg/Kg-dry	256093	10000
delta-BHC	1.9		0.049	0.13	mg/Kg-dry	256093	50
gamma-BHC	0.99		0.046	0.13	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	35.1		0	0	wt%	R363580	1
Client Sample ID: F5 (0-1) 021318				**Lab ID:** 1802E95-003			
Collection Date: 2/13/2018 9:48:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	158		2.26	26.2	mg/Kg-dry	256073	50
Copper	240		2.67	5.24	mg/Kg-dry	256073	50
Lead	2330		1.50	2.62	mg/Kg-dry	256073	50
Zinc	719		2.62	26.2	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.75		0.057	0.24	mg/Kg-dry	256093	50
4,4´-DDT	1.9		0.055	0.24	mg/Kg-dry	256093	50
beta-BHC	0.29		0.039	0.12	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	31.4		0	0	wt%	R363580	1
Client Sample ID: F6 (0-1) 021318				**Lab ID:** 1802E95-004			
Collection Date: 2/13/2018 10:06:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			

Analytical Environmental Services, Inc

Date: 27-Feb-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F6 (0-1) 021318				**Lab ID:** 1802E95-004			
Collection Date: 2/13/2018 10:06:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	286		2.20	25.5	mg/Kg-dry	256073	50
Copper	549		2.59	5.10	mg/Kg-dry	256073	50
Lead	5550		1.46	2.55	mg/Kg-dry	256073	50
Zinc	717		2.55	25.5	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.072		0.0089	0.046	mg/Kg-dry	256093	10
4,4´-DDE	0.44		0.011	0.046	mg/Kg-dry	256093	10
4,4´-DDT	2.3		0.10	0.46	mg/Kg-dry	256093	100
alpha-BHC	0.028		0.011	0.023	mg/Kg-dry	256093	10
beta-BHC	0.17		0.0074	0.023	mg/Kg-dry	256093	10
Dieldrin	0.18		0.0096	0.046	mg/Kg-dry	256093	10
PERCENT MOISTURE D2216							
Percent Moisture	27.6		0	0	wt%	R363580	1
Client Sample ID: F7 (0-1) 021318				**Lab ID:** 1802E95-005			
Collection Date: 2/13/2018 10:28:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	345		2.03	23.6	mg/Kg-dry	256073	50
Copper	376		2.40	4.72	mg/Kg-dry	256073	50
Lead	5840		1.35	2.36	mg/Kg-dry	256073	50
Zinc	442		2.36	23.6	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.17		0.0085	0.044	mg/Kg-dry	256093	10
4,4´-DDE	2.2		0.10	0.44	mg/Kg-dry	256093	100
4,4´-DDT	5.8		0.099	0.44	mg/Kg-dry	256093	100
alpha-BHC	0.041		0.010	0.022	mg/Kg-dry	256093	10
alpha-Chlordane	0.045		0.0093	0.022	mg/Kg-dry	256093	10
beta-BHC	0.13		0.0070	0.022	mg/Kg-dry	256093	10
Dieldrin	6.1		0.092	0.44	mg/Kg-dry	256093	100
gamma-BHC	0.031		0.0078	0.022	mg/Kg-dry	256093	10
gamma-Chlordane	0.088		0.0089	0.022	mg/Kg-dry	256093	10
Toxaphene	4.3		0.11	2.2	mg/Kg-dry	256093	10
PERCENT MOISTURE D2216							
Percent Moisture	23.9		0	0	wt%	R363580	1
Client Sample ID: D9 (0-1) 021318				**Lab ID:** 1802E95-006			
Collection Date: 2/13/2018 10:36:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	105		2.11	24.5	mg/Kg-dry	256073	50
Copper	336		2.49	4.90	mg/Kg-dry	256073	50
Lead	1820		1.41	2.45	mg/Kg-dry	256073	50
Zinc	1160		2.45	24.5	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.80		0.054	0.23	mg/Kg-dry	256093	50
4,4´-DDT	4.4		0.052	0.23	mg/Kg-dry	256093	50
beta-BHC	1.4		0.037	0.11	mg/Kg-dry	256093	50

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D9 (0-1) 021318				**Lab ID:** 1802E95-006			
Collection Date: 2/13/2018 10:36:00 AM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
Dieldrin	0.27		0.048	0.23	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	27.2		0	0	wt%	R363580	1
Client Sample ID: F8 (0-1) 021318				**Lab ID:** 1802E95-007			
Collection Date: 2/13/2018 10:38:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	399		2.07	24.0	mg/Kg-dry	256073	50
Copper	1010		2.43	4.79	mg/Kg-dry	256073	50
Lead	15100		2.75	4.79	mg/Kg-dry	256073	100
Zinc	1530		2.40	24.0	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.17		0.010	0.043	mg/Kg-dry	256093	10
4,4´-DDT	0.41		0.0099	0.043	mg/Kg-dry	256093	10
beta-BHC	0.46		0.0070	0.022	mg/Kg-dry	256093	10
PERCENT MOISTURE D2216							
Percent Moisture	23.4		0	0	wt%	R363580	1
Client Sample ID: F9 (0-1) 021318				**Lab ID:** 1802E95-008			
Collection Date: 2/13/2018 10:50:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	296		2.03	23.6	mg/Kg-dry	256073	50
Copper	1270		2.40	4.71	mg/Kg-dry	256073	50
Lead	5550		1.35	2.36	mg/Kg-dry	256073	50
Zinc	1370		2.36	23.6	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.41		0.020	0.085	mg/Kg-dry	256093	20
4,4´-DDT	0.83		0.019	0.085	mg/Kg-dry	256093	20
PERCENT MOISTURE D2216							
Percent Moisture	21.9		0	0	wt%	R363580	1
Client Sample ID: D8 (0-1) 021318				**Lab ID:** 1802E95-009			
Collection Date: 2/13/2018 10:56:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	152		2.04	23.7	mg/Kg-dry	256073	50
Copper	784		2.40	4.73	mg/Kg-dry	256073	50
Lead	2610		1.36	2.37	mg/Kg-dry	256073	50
Zinc	3130		2.37	23.7	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.67		0.051	0.22	mg/Kg-dry	256093	50
4,4´-DDT	1.1		0.049	0.22	mg/Kg-dry	256093	50
beta-BHC	0.15		0.035	0.11	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	23.2		0	0	wt%	R363742	1
Client Sample ID: F10 (0-1) 021318				**Lab ID:** 1802E95-010			
Collection Date: 2/13/2018 11:02:00 AM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	173		2.05	23.8	mg/Kg-dry	256073	50
Copper	646		2.42	4.77	mg/Kg-dry	256073	50
Lead	1420		1.37	2.38	mg/Kg-dry	256073	50
Zinc	764		2.38	23.8	mg/Kg-dry	256073	50
PERCENT MOISTURE D2216							
Percent Moisture	21.5		0	0	wt%	R363742	1
Client Sample ID: D7 (0-1) 021318				**Lab ID:** 1802E95-011			
Collection Date: 2/13/2018 11:21:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	74.4		1.94	22.5	mg/Kg-dry	256073	50
Copper	224		2.29	4.51	mg/Kg-dry	256073	50
Lead	737		1.29	2.25	mg/Kg-dry	256073	50
Zinc	403		2.26	22.5	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.088		0.016	0.083	mg/Kg-dry	256093	20
4,4´-DDE	0.42		0.019	0.083	mg/Kg-dry	256093	20
4,4´-DDT	1.5		0.019	0.083	mg/Kg-dry	256093	20
alpha-BHC	0.076		0.020	0.042	mg/Kg-dry	256093	20
beta-BHC	0.61		0.013	0.042	mg/Kg-dry	256093	20
Toxaphene	8.9		0.21	4.2	mg/Kg-dry	256093	20
PERCENT MOISTURE D2216							
Percent Moisture	19.8		0	0	wt%	R363742	1
Client Sample ID: C7 (0-1) 021318				**Lab ID:** 1802E95-012			
Collection Date: 2/13/2018 11:33:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	17.0		2.18	10.9	mg/Kg-dry	256073	50
Copper	48.2		2.57	5.07	mg/Kg-dry	256073	50
Lead	166		1.45	2.53	mg/Kg-dry	256073	50
Zinc	158		2.53	25.3	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.074		0.0056	0.024	mg/Kg-dry	256093	5
4,4´-DDT	0.054		0.0054	0.024	mg/Kg-dry	256093	5
beta-BHC	0.015		0.0038	0.012	mg/Kg-dry	256093	5
PERCENT MOISTURE D2216							
Percent Moisture	30.0		0	0	wt%	R363742	1
Client Sample ID: C6 (0-1) 021318				**Lab ID:** 1802E95-013			
Collection Date: 2/13/2018 11:51:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	232		2.07	24.0	mg/Kg-dry	256073	50
Copper	248		2.44	4.81	mg/Kg-dry	256073	50
Lead	45100		5.51	9.61	mg/Kg-dry	256073	200
Zinc	401		2.40	24.0	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.22		0.021	0.090	mg/Kg-dry	256093	20
4,4´-DDT	0.94		0.020	0.090	mg/Kg-dry	256093	20

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C6 (0-1) 021318				**Lab ID:** 1802E95-013			
Collection Date: 2/13/2018 11:51:00 AM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
beta-BHC	0.16		0.014	0.045	mg/Kg-dry	256093	20
PERCENT MOISTURE D2216							
Percent Moisture	26.2		0	0	wt%	R363742	1
Client Sample ID: C5 (0-1) 021318				**Lab ID:** 1802E95-014			
Collection Date: 2/13/2018 12:12:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	175		2.18	25.3	mg/Kg-dry	256073	50
Copper	130		2.57	5.05	mg/Kg-dry	256073	50
Lead	957		1.45	2.53	mg/Kg-dry	256073	50
Zinc	601		2.53	25.3	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.36		0.043	0.22	mg/Kg-dry	256093	50
4,4´-DDE	0.64		0.052	0.22	mg/Kg-dry	256093	50
4,4´-DDT	5.8		0.051	0.22	mg/Kg-dry	256093	50
alpha-Chlordane	0.22		0.048	0.11	mg/Kg-dry	256093	50
beta-BHC	0.44		0.036	0.11	mg/Kg-dry	256093	50
Dieldrin	0.63		0.047	0.22	mg/Kg-dry	256093	50
gamma-Chlordane	0.20		0.045	0.11	mg/Kg-dry	256093	50
Toxaphene	17		0.55	11	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	25.6		0	0	wt%	R363742	1
Client Sample ID: D5 (0-1) 021318				**Lab ID:** 1802E95-015			
Collection Date: 2/13/2018 12:15:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	871		2.13	370	mg/Kg-dry	256073	50
Copper	1240		2.51	4.94	mg/Kg-dry	256073	50
Lead	7990		1.42	2.47	mg/Kg-dry	256073	50
Zinc	2310		2.47	24.7	mg/Kg-dry	256073	50
PERCENT MOISTURE D2216							
Percent Moisture	23.3		0	0	wt%	R363742	1
Client Sample ID: C4 (0-1) 021318				**Lab ID:** 1802E95-016			
Collection Date: 2/13/2018 12:29:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	52.3		2.40	4.73	mg/Kg-dry	256073	50
Lead	59.1		1.36	2.36	mg/Kg-dry	256073	50
Zinc	96.5		2.37	23.6	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.46		0.043	0.22	mg/Kg-dry	256093	50
4,4´-DDE	0.50		0.052	0.22	mg/Kg-dry	256093	50
4,4´-DDT	4.1		0.050	0.22	mg/Kg-dry	256093	50
alpha-Chlordane	0.14		0.047	0.11	mg/Kg-dry	256093	50
beta-BHC	0.19		0.035	0.11	mg/Kg-dry	256093	50
Dieldrin	2.1		0.046	0.22	mg/Kg-dry	256093	50

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C4 (0-1) 021318				**Lab ID:** 1802E95-016			
Collection Date: 2/13/2018 12:29:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
gamma-BHC	0.13		0.040	0.11	mg/Kg-dry	256093	50
gamma-Chlordane	0.16		0.045	0.11	mg/Kg-dry	256093	50
Toxaphene	21		0.55	11	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	24.6		0	0	wt%	R363742	1
Client Sample ID: F11 (0-1) 021318				**Lab ID:** 1802E95-018			
Collection Date: 2/13/2018 1:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	39.1		2.13	24.7	mg/Kg-dry	256073	50
Copper	70.0		2.51	4.94	mg/Kg-dry	256073	50
Lead	344		1.42	2.47	mg/Kg-dry	256073	50
Zinc	194		2.47	24.7	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.12		0.017	0.087	mg/Kg-dry	256093	20
4,4´-DDE	0.35		0.020	0.087	mg/Kg-dry	256093	20
4,4´-DDT	4.8		0.20	0.87	mg/Kg-dry	256093	200
beta-BHC	0.047		0.014	0.044	mg/Kg-dry	256093	20
Dieldrin	0.48		0.018	0.087	mg/Kg-dry	256093	20
PERCENT MOISTURE D2216							
Percent Moisture	23.6		0	0	wt%	R363742	1
Client Sample ID: F12 (0-1) 021318				**Lab ID:** 1802E95-019			
Collection Date: 2/13/2018 1:28:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	37.1		2.04	23.7	mg/Kg-dry	256073	50
Copper	257		2.41	4.74	mg/Kg-dry	256073	50
Lead	1350		1.36	2.37	mg/Kg-dry	256073	50
Zinc	583		2.37	23.7	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	2.5		0.042	0.22	mg/Kg-dry	256093	50
4,4´-DDE	2.4		0.051	0.22	mg/Kg-dry	256093	50
4,4´-DDT	7.9		0.098	0.43	mg/Kg-dry	256093	100
alpha-BHC	0.19		0.052	0.11	mg/Kg-dry	256093	50
alpha-Chlordane	0.84		0.046	0.11	mg/Kg-dry	256093	50
beta-BHC	1.0		0.035	0.11	mg/Kg-dry	256093	50
Dieldrin	1.5		0.045	0.22	mg/Kg-dry	256093	50
gamma-Chlordane	2.5		0.044	0.11	mg/Kg-dry	256093	50
PERCENT MOISTURE D2216							
Percent Moisture	22.7		0	0	wt%	R363742	1
Client Sample ID: F13 (0-1) 021318				**Lab ID:** 1802E95-020			
Collection Date: 2/13/2018 1:40:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	308		1.67	291	mg/Kg-dry	256076	50
Copper	35.4		1.97	3.88	mg/Kg-dry	256076	50

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F13 (0-1) 021318				**Lab ID:** 1802E95-020			
Collection Date: 2/13/2018 1:40:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Lead	161		1.11	1.94	mg/Kg-dry	256076	50
Zinc	133		1.94	19.4	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.97		0.093	0.41	mg/Kg-dry	256094	100
PERCENT MOISTURE D2216							
Percent Moisture	18.5		0	0	wt%	R363742	1
Client Sample ID: F14 (0-1) 021318				**Lab ID:** 1802E95-021			
Collection Date: 2/13/2018 1:52:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	21.9		1.96	9.11	mg/Kg-dry	256076	50
Copper	41.5		2.32	4.56	mg/Kg-dry	256076	50
Lead	189		1.31	2.28	mg/Kg-dry	256076	50
Zinc	209		2.28	22.8	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.84		0.094	0.40	mg/Kg-dry	256094	100
4,4´-DDT	1.8		0.091	0.40	mg/Kg-dry	256094	100
PERCENT MOISTURE D2216							
Percent Moisture	16.7		0	0	wt%	R363742	1
Client Sample ID: F15 (0-1) 021318				**Lab ID:** 1802E95-022			
Collection Date: 2/13/2018 2:02:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	9.38		2.24	7.79	mg/Kg-dry	256076	50
Copper	34.4		2.64	5.19	mg/Kg-dry	256076	50
Lead	93.4		1.49	2.60	mg/Kg-dry	256076	50
Zinc	154		2.60	26.0	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.55		0.021	0.088	mg/Kg-dry	256094	20
4,4´-DDT	1.3		0.020	0.088	mg/Kg-dry	256094	20
alpha-Chlordane	0.058		0.019	0.044	mg/Kg-dry	256094	20
Dieldrin	0.100		0.018	0.088	mg/Kg-dry	256094	20
gamma-Chlordane	0.082		0.018	0.044	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	24.2		0	0	wt%	R363742	1
Client Sample ID: D3 (0-1) 021318				**Lab ID:** 1802E95-023			
Collection Date: 2/13/2018 2:15:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	39.5		2.25	26.1	mg/Kg-dry	256076	50
Copper	107		2.65	5.21	mg/Kg-dry	256076	50
Lead	361		1.50	2.61	mg/Kg-dry	256076	50
Zinc	162		2.61	26.1	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.35		0.048	0.21	mg/Kg-dry	256094	50
beta-BHC	0.49		0.034	0.11	mg/Kg-dry	256094	50

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D3 (0-1) 021318				**Lab ID:** 1802E95-023			
Collection Date: 2/13/2018 2:15:00 PM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	20.8		0	0	wt%	R363742	1
Client Sample ID: F16 (0-1) 021318				**Lab ID:** 1802E95-024			
Collection Date: 2/13/2018 2:28:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	47.6		2.33	4.58	mg/Kg-dry	256076	50
Lead	99.5		1.31	2.29	mg/Kg-dry	256076	50
Zinc	104		2.29	22.9	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	1.7		0.021	0.088	mg/Kg-dry	256094	20
4,4´-DDT	2.1		0.020	0.088	mg/Kg-dry	256094	20
gamma-Chlordane	0.047		0.018	0.044	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	24.7		0	0	wt%	R363742	1
Client Sample ID: D2 (0-1) 021318				**Lab ID:** 1802E95-025			
Collection Date: 2/13/2018 2:33:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	29.9		2.02	23.4	mg/Kg-dry	256076	50
Copper	183		2.38	4.69	mg/Kg-dry	256076	50
Lead	299		1.34	2.34	mg/Kg-dry	256076	50
Zinc	491		2.35	23.4	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.58		0.022	0.094	mg/Kg-dry	256094	20
4,4´-DDT	1.5		0.021	0.094	mg/Kg-dry	256094	20
beta-BHC	0.051		0.015	0.047	mg/Kg-dry	256094	20
Dieldrin	0.098		0.020	0.094	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	28.9		0	0	wt%	R363742	1
Client Sample ID: C3 (0-1) 021318				**Lab ID:** 1802E95-026			
Collection Date: 2/13/2018 2:40:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	51.2		2.01	23.3	mg/Kg-dry	256076	50
Copper	159		2.37	4.66	mg/Kg-dry	256076	50
Lead	481		1.34	2.33	mg/Kg-dry	256076	50
Zinc	445		2.33	23.3	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	1.0		0.051	0.22	mg/Kg-dry	256094	50
4,4´-DDT	2.6		0.049	0.22	mg/Kg-dry	256094	50
gamma-Chlordane	0.13		0.044	0.11	mg/Kg-dry	256094	50
PERCENT MOISTURE D2216							
Percent Moisture	23.1		0	0	wt%	R363742	1
Client Sample ID: F17 (0-1) 021318				**Lab ID:** 1802E95-027			
Collection Date: 2/13/2018 2:44:00 PM				**Matrix:** Soil			

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F17 (0-1) 021318				**Lab ID:** 1802E95-027			
Collection Date: 2/13/2018 2:44:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	7.80		2.02	7.46	mg/Kg-dry	256076	50
Copper	34.0		2.38	4.69	mg/Kg-dry	256076	50
Lead	132		1.34	2.35	mg/Kg-dry	256076	50
Zinc	301		2.35	23.5	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.33		0.051	0.22	mg/Kg-dry	256094	50
4,4´-DDT	0.62		0.049	0.22	mg/Kg-dry	256094	50
PERCENT MOISTURE D2216							
Percent Moisture	22.9		0	0	wt%	R363742	1
Client Sample ID: D1 (0-1) 021318				**Lab ID:** 1802E95-028			
Collection Date: 2/13/2018 3:00:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	23.0		2.13	11.1	mg/Kg-dry	256076	50
Copper	149		2.51	4.93	mg/Kg-dry	256076	50
Lead	551		1.41	2.47	mg/Kg-dry	256076	50
Zinc	492		2.47	24.7	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.38		0.055	0.23	mg/Kg-dry	256094	50
4,4´-DDT	2.4		0.053	0.23	mg/Kg-dry	256094	50
beta-BHC	0.22		0.037	0.12	mg/Kg-dry	256094	50
PERCENT MOISTURE D2216							
Percent Moisture	28.4		0	0	wt%	R363742	1
Client Sample ID: E8 (0-1) 021318				**Lab ID:** 1802E95-029			
Collection Date: 2/13/2018 3:04:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	573		1.60	279	mg/Kg-dry	256076	50
Copper	656		1.89	3.71	mg/Kg-dry	256076	50
Lead	8850		1.06	1.86	mg/Kg-dry	256076	50
Zinc	835		1.86	18.6	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.25		0.0082	0.042	mg/Kg-dry	256094	10
4,4´-DDE	0.33		0.0099	0.042	mg/Kg-dry	256094	10
4,4´-DDT	12		0.096	0.42	mg/Kg-dry	256094	100
alpha-BHC	0.022		0.010	0.021	mg/Kg-dry	256094	10
beta-BHC	0.17		0.0068	0.021	mg/Kg-dry	256094	10
Dieldrin	0.10		0.0088	0.042	mg/Kg-dry	256094	10
gamma-Chlordane	0.045		0.0086	0.021	mg/Kg-dry	256094	10
Heptachlor	0.047		0.0093	0.021	mg/Kg-dry	256094	10
Toxaphene	2.2		0.10	2.1	mg/Kg-dry	256094	10
PERCENT MOISTURE D2216							
Percent Moisture	21.1		0	0	wt%	R363742	1
Client Sample ID: E7 (0-1) 021318				**Lab ID:** 1802E95-030			
Collection Date: 2/13/2018 3:23:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E7 (0-1) 021318				**Lab ID:** 1802E95-030			
Collection Date: 2/13/2018 3:23:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	115		2.85	33.1	mg/Kg-dry	256076	50
Copper	80.4		3.36	6.61	mg/Kg-dry	256076	50
Lead	1730		1.90	3.31	mg/Kg-dry	256076	50
Zinc	156		3.31	33.1	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.50		0.022	0.094	mg/Kg-dry	256094	20
4,4´-DDT	1.3		0.021	0.094	mg/Kg-dry	256094	20
Dieldrin	0.10		0.020	0.094	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	28.8		0	0	wt%	R363742	1
Client Sample ID: E6 (0-1) 021318				**Lab ID:** 1802E95-031			
Collection Date: 2/13/2018 3:46:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	120		2.73	31.7	mg/Kg-dry	256076	50
Copper	195		3.22	6.33	mg/Kg-dry	256076	50
Lead	1230		1.82	3.17	mg/Kg-dry	256076	50
Zinc	451		3.17	31.7	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.12		0.017	0.085	mg/Kg-dry	256094	20
4,4´-DDE	0.63		0.020	0.085	mg/Kg-dry	256094	20
4,4´-DDT	3.4		0.048	0.21	mg/Kg-dry	256094	50
alpha-Chlordane	0.047		0.018	0.043	mg/Kg-dry	256094	20
beta-BHC	0.10		0.014	0.043	mg/Kg-dry	256094	20
Dieldrin	0.31		0.018	0.085	mg/Kg-dry	256094	20
gamma-Chlordane	0.12		0.017	0.043	mg/Kg-dry	256094	20
Toxaphene	4.8		0.21	4.3	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	22.0		0	0	wt%	R363742	1
Client Sample ID: E3 (0-1) 021318				**Lab ID:** 1802E95-032			
Collection Date: 2/13/2018 4:00:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	221		2.20	25.5	mg/Kg-dry	256076	50
Copper	380		2.59	5.10	mg/Kg-dry	256076	50
Lead	2460		1.46	2.55	mg/Kg-dry	256076	50
Zinc	753		2.55	25.5	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	1.2		0.022	0.095	mg/Kg-dry	256094	20
4,4´-DDT	2.1		0.021	0.095	mg/Kg-dry	256094	20
alpha-BHC	0.091		0.023	0.047	mg/Kg-dry	256094	20
alpha-Chlordane	0.100		0.020	0.047	mg/Kg-dry	256094	20
beta-BHC	0.26		0.015	0.047	mg/Kg-dry	256094	20
Dieldrin	0.56		0.020	0.095	mg/Kg-dry	256094	20
gamma-BHC	0.061		0.017	0.047	mg/Kg-dry	256094	20
gamma-Chlordane	0.15		0.019	0.047	mg/Kg-dry	256094	20

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E3 (0-1) 021318				**Lab ID:** 1802E95-032			
Collection Date: 2/13/2018 4:00:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
Toxaphene	8.7		0.23	4.7	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	29.5		0	0	wt%	R363742	1
Client Sample ID: E5 (0-1) 021318				**Lab ID:** 1802E95-033			
Collection Date: 2/13/2018 4:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	196		2.12	24.5	mg/Kg-dry	256073	50
Copper	250		2.49	4.90	mg/Kg-dry	256073	50
Lead	2100		1.41	2.45	mg/Kg-dry	256073	50
Zinc	390		2.45	24.5	mg/Kg-dry	256073	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.10		0.017	0.090	mg/Kg-dry	256093	20
4,4´-DDE	1.3		0.021	0.090	mg/Kg-dry	256093	20
4,4´-DDT	1.5		0.021	0.090	mg/Kg-dry	256093	20
beta-BHC	0.42		0.015	0.045	mg/Kg-dry	256093	20
Dieldrin	0.21		0.019	0.090	mg/Kg-dry	256093	20
gamma-Chlordane	0.055		0.018	0.045	mg/Kg-dry	256093	20
Toxaphene	8.4		0.22	4.5	mg/Kg-dry	256093	20
PERCENT MOISTURE D2216							
Percent Moisture	26.2		0	0	wt%	R363742	1
Client Sample ID: E2 (0-1) 021318				**Lab ID:** 1802E95-034			
Collection Date: 2/13/2018 4:13:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	109		2.65	30.7	mg/Kg-dry	256076	50
Copper	305		3.12	6.15	mg/Kg-dry	256076	50
Lead	1190		1.76	3.07	mg/Kg-dry	256076	50
Zinc	439		3.08	30.7	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.12		0.012	0.050	mg/Kg-dry	256094	10
4,4´-DDT	0.055		0.011	0.050	mg/Kg-dry	256094	10
PERCENT MOISTURE D2216							
Percent Moisture	33.0		0	0	wt%	R363742	1
Client Sample ID: E4 (0-1) 021318				**Lab ID:** 1802E95-035			
Collection Date: 2/13/2018 4:36:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	154		2.13	24.7	mg/Kg-dry	256076	50
Copper	270		2.51	4.94	mg/Kg-dry	256076	50
Lead	1380		1.42	2.47	mg/Kg-dry	256076	50
Zinc	491		2.47	24.7	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.35		0.023	0.097	mg/Kg-dry	256094	20
4,4´-DDT	0.38		0.022	0.097	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E4 (0-1) 021318				**Lab ID:** 1802E95-035			
Collection Date: 2/13/2018 4:36:00 PM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	31.4		0	0	wt%	R363742	1
Client Sample ID: D6 (0-1) 021318				**Lab ID:** 1802E95-036			
Collection Date: 2/13/2018 4:51:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	13.4		2.59	9.63	mg/Kg-dry	256076	50
Copper	39.9		3.06	6.02	mg/Kg-dry	256076	50
Lead	107		1.73	3.01	mg/Kg-dry	256076	50
Zinc	124		3.01	30.1	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.11		0.0080	0.042	mg/Kg-dry	256094	10
4,4´-DDE	0.13		0.0097	0.042	mg/Kg-dry	256094	10
4,4´-DDT	0.84		0.0094	0.042	mg/Kg-dry	256094	10
Dieldrin	0.050		0.0087	0.042	mg/Kg-dry	256094	10
gamma-Chlordane	0.029		0.0084	0.021	mg/Kg-dry	256094	10
PERCENT MOISTURE D2216							
Percent Moisture	19.9		0	0	wt%	R363742	1
Client Sample ID: F18 (0-1) 021418				**Lab ID:** 1802E95-037			
Collection Date: 2/14/2018 9:15:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	34.2		2.77	5.46	mg/Kg-dry	256076	50
Lead	45.2		1.57	2.73	mg/Kg-dry	256076	50
Zinc	140		2.73	27.3	mg/Kg-dry	256076	50
PERCENT MOISTURE D2216							
Percent Moisture	30.0		0	0	wt%	R363742	1
Client Sample ID: F19 (0-1) 021418				**Lab ID:** 1802E95-038			
Collection Date: 2/14/2018 9:30:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	31.2		1.79	3.52	mg/Kg-dry	256076	50
Lead	37.1		1.01	1.76	mg/Kg-dry	256076	50
Zinc	106		1.76	17.6	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.30		0.019	0.084	mg/Kg-dry	256094	20
PERCENT MOISTURE D2216							
Percent Moisture	20.8		0	0	wt%	R363742	1
Client Sample ID: F20 (0-1) 021418				**Lab ID:** 1802E95-039			
Collection Date: 2/14/2018 9:44:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	52.9		2.15	4.22	mg/Kg-dry	256076	50
Lead	80.2		1.21	2.11	mg/Kg-dry	256076	50
Zinc	139		2.11	21.1	mg/Kg-dry	256076	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.055		0.0092	0.041	mg/Kg-dry	256094	10

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F20 (0-1) 021418				**Lab ID:** 1802E95-039			
Collection Date: 2/14/2018 9:44:00 AM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	18.2		0	0	wt%	R363742	1
Client Sample ID: F21 (0-1) 021418				**Lab ID:** 1802E95-040			
Collection Date: 2/14/2018 9:55:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	18.8		2.31	9.90	mg/Kg-dry	256076	50
Copper	38.2		2.72	5.35	mg/Kg-dry	256076	50
Lead	146		1.53	2.67	mg/Kg-dry	256076	50
Zinc	351		2.68	26.7	mg/Kg-dry	256076	50
PERCENT MOISTURE D2216							
Percent Moisture	23.7		0	0	wt%	R363742	1
Client Sample ID: F22 (0-1) 021418				**Lab ID:** 1802E95-041			
Collection Date: 2/14/2018 10:05:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	32.0		3.33	6.55	mg/Kg-dry	256077	50
Lead	189		1.88	3.27	mg/Kg-dry	256077	50
Zinc	700		3.28	32.7	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.63		0.11	0.49	mg/Kg-dry	256197	100
PERCENT MOISTURE D2216							
Percent Moisture	32.2		0	0	wt%	R363742	1
Client Sample ID: F23 (0-1) 021418				**Lab ID:** 1802E95-042			
Collection Date: 2/14/2018 10:27:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	8.38		1.80	7.48	mg/Kg-dry	256077	50
Copper	31.9		2.12	4.18	mg/Kg-dry	256077	50
Lead	183		1.20	2.09	mg/Kg-dry	256077	50
Zinc	609		2.09	20.9	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.76		0.050	0.22	mg/Kg-dry	256197	50
PERCENT MOISTURE D2216							
Percent Moisture	23.9		0	0	wt%	R363742	1
Client Sample ID: F24 (0-1) 021418				**Lab ID:** 1802E95-043			
Collection Date: 2/14/2018 10:41:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	33.8		2.47	4.87	mg/Kg-dry	256077	50
Lead	262		1.40	2.43	mg/Kg-dry	256077	50
Zinc	894		2.44	24.3	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.069		0.010	0.044	mg/Kg-dry	256197	10
4,4´-DDT	0.14		0.0100	0.044	mg/Kg-dry	256197	10
PERCENT MOISTURE D2216							
Percent Moisture	24.1		0	0	wt%	R363742	1

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F25 (0-1) 021418				**Lab ID:** 1802E95-045			
Collection Date: 2/14/2018 10:55:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	61.4		1.50	17.4	mg/Kg-dry	256077	50
Copper	77.0		1.77	3.49	mg/Kg-dry	256077	50
Lead	2610		1.000	1.74	mg/Kg-dry	256077	50
Zinc	669		1.75	17.4	mg/Kg-dry	256077	50
PERCENT MOISTURE D2216							
Percent Moisture	27.2		0	0	wt%	R363742	1
Client Sample ID: F26 (0-1) 021418				**Lab ID:** 1802E95-046			
Collection Date: 2/14/2018 11:08:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	120		1.61	18.7	mg/Kg-dry	256077	50
Copper	48.9		1.90	3.74	mg/Kg-dry	256077	50
Lead	5310		1.07	1.87	mg/Kg-dry	256077	50
Zinc	193		1.87	18.7	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.064		0.010	0.044	mg/Kg-dry	256197	10
4,4´-DDT	0.064		0.0099	0.044	mg/Kg-dry	256197	10
PERCENT MOISTURE D2216							
Percent Moisture	23.5		0	0	wt%	R363742	1
Client Sample ID: F27 (0-1) 021418				**Lab ID:** 1802E95-047			
Collection Date: 2/14/2018 11:22:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	16.8		2.00	10.5	mg/Kg-dry	256077	50
Copper	24.3		2.36	4.65	mg/Kg-dry	256077	50
Lead	327		1.33	2.32	mg/Kg-dry	256077	50
Zinc	364		2.33	23.2	mg/Kg-dry	256077	50
PERCENT MOISTURE D2216							
Percent Moisture	21.3		0	0	wt%	R363742	1
Client Sample ID: F28 (0-1) 021418				**Lab ID:** 1802E95-048			
Collection Date: 2/14/2018 11:55:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	60.1		1.92	22.3	mg/Kg-dry	256077	50
Copper	43.8		2.26	4.46	mg/Kg-dry	256077	50
Lead	1890		1.28	2.23	mg/Kg-dry	256077	50
Zinc	780		2.23	22.3	mg/Kg-dry	256077	50
PERCENT MOISTURE D2216							
Percent Moisture	25.9		0	0	wt%	R363742	1
Client Sample ID: D4 (0-1) 021418				**Lab ID:** 1802E95-049			
Collection Date: 2/14/2018 12:02:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	664		2.94	511	mg/Kg-dry	256077	100
Copper	1790		1.73	3.40	mg/Kg-dry	256077	50
Lead	7080		0.976	1.70	mg/Kg-dry	256077	50
Zinc	2680		1.70	17.0	mg/Kg-dry	256077	50

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D4 (0-1) 021418				**Lab ID:** 1802E95-049			
Collection Date: 2/14/2018 12:02:00 PM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	13.4		0	0	wt%	R363742	1
Client Sample ID: F29 (0-1) 021418				**Lab ID:** 1802E95-050			
Collection Date: 2/14/2018 12:20:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	19.2		1.75	12.2	mg/Kg-dry	256077	50
Copper	48.0		2.06	4.06	mg/Kg-dry	256077	50
Lead	344		1.16	2.03	mg/Kg-dry	256077	50
Zinc	588		2.03	20.3	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.77		0.049	0.26	mg/Kg-dry	256197	50
4,4´-DDE	0.71		0.060	0.26	mg/Kg-dry	256197	50
4,4´-DDT	17		0.58	2.6	mg/Kg-dry	256197	500
alpha-Chlordane	0.60		0.055	0.13	mg/Kg-dry	256197	50
beta-BHC	0.38		0.041	0.13	mg/Kg-dry	256197	50
Dieldrin	15		0.53	2.6	mg/Kg-dry	256197	500
gamma-Chlordane	0.56		0.052	0.13	mg/Kg-dry	256197	50
Heptachlor	0.37		0.056	0.13	mg/Kg-dry	256197	50
PERCENT MOISTURE D2216							
Percent Moisture	34.8		0	0	wt%	R363742	1
Client Sample ID: F30 (0-1) 021418				**Lab ID:** 1802E95-051			
Collection Date: 2/14/2018 12:34:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	19.9		2.81	5.53	mg/Kg-dry	256077	50
Lead	46.5		1.58	2.76	mg/Kg-dry	256077	50
Zinc	97.0		2.77	27.6	mg/Kg-dry	256077	50
PERCENT MOISTURE D2216							
Percent Moisture	28.0		0	0	wt%	R363742	1
Client Sample ID: F31 (0-1) 021418				**Lab ID:** 1802E95-052			
Collection Date: 2/14/2018 12:54:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	27.6		1.87	21.7	mg/Kg-dry	256077	50
Copper	37.2		2.21	4.35	mg/Kg-dry	256077	50
Lead	238		1.25	2.17	mg/Kg-dry	256077	50
Zinc	147		2.17	21.7	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.72		0.011	0.045	mg/Kg-dry	256197	10
4,4´-DDT	82		1.0	4.5	mg/Kg-dry	256197	1000
alpha-Chlordane	0.078		0.0096	0.022	mg/Kg-dry	256197	10
beta-BHC	0.46		0.0072	0.022	mg/Kg-dry	256197	10
Dieldrin	1.1		0.0094	0.045	mg/Kg-dry	256197	10
gamma-Chlordane	0.22		0.0091	0.022	mg/Kg-dry	256197	10
Heptachlor	0.17		0.0099	0.022	mg/Kg-dry	256197	10
PERCENT MOISTURE D2216							

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F31 (0-1) 021418				**Lab ID:** 1802E95-052			
Collection Date: 2/14/2018 12:54:00 PM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	25.8		0	0	wt%	R363742	1
Client Sample ID: E35 (0-1) 021418				**Lab ID:** 1802E95-053			
Collection Date: 2/14/2018 1:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	11.0		1.91	3.77	mg/Kg-dry	256077	50
Lead	33.7		1.08	1.88	mg/Kg-dry	256077	50
Zinc	33.9		1.89	18.8	mg/Kg-dry	256077	50
PERCENT MOISTURE D2216							
Percent Moisture	19.0		0	0	wt%	R363742	1
Client Sample ID: E34 (0-1) 021418				**Lab ID:** 1802E95-054			
Collection Date: 2/14/2018 1:22:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	13.3		1.92	3.77	mg/Kg-dry	256077	50
Lead	67.3		1.08	1.89	mg/Kg-dry	256077	50
Zinc	46.1		1.89	18.9	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.0074		0.00099	0.0042	mg/Kg-dry	256197	1
PERCENT MOISTURE D2216							
Percent Moisture	20.9		0	0	wt%	R363742	1
Client Sample ID: C10 (0-1) 021418				**Lab ID:** 1802E95-055			
Collection Date: 2/14/2018 1:38:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	11.3		1.64	9.52	mg/Kg-dry	256077	50
Copper	27.1		1.94	3.81	mg/Kg-dry	256077	50
Lead	69.2		1.09	1.90	mg/Kg-dry	256077	50
Zinc	94.5		1.91	19.0	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.23		0.037	0.19	mg/Kg-dry	256197	50
4,4´-DDE	1.1		0.044	0.19	mg/Kg-dry	256197	50
4,4´-DDT	2.6		0.043	0.19	mg/Kg-dry	256197	50
PERCENT MOISTURE D2216							
Percent Moisture	12.1		0	0	wt%	R363742	1
Client Sample ID: F32 (0-1) 021418				**Lab ID:** 1802E95-056			
Collection Date: 2/14/2018 1:42:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	13.8		1.69	9.79	mg/Kg-dry	256077	50
Copper	39.5		1.99	3.91	mg/Kg-dry	256077	50
Lead	136		1.12	1.96	mg/Kg-dry	256077	50
Zinc	135		1.96	19.6	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.27		0.0084	0.043	mg/Kg-dry	256197	10
4,4´-DDE	0.18		0.010	0.043	mg/Kg-dry	256197	10

Analytical Environmental Services, Inc

Date: 27-Feb-18

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: F32 (0-1) 021418				**Lab ID:** 1802E95-056			
Collection Date: 2/14/2018 1:42:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	6.5		0.49	2.2	mg/Kg-dry	256197	500
beta-BHC	0.094		0.0070	0.022	mg/Kg-dry	256197	10
delta-BHC	0.024		0.0083	0.022	mg/Kg-dry	256197	10
Dieldrin	0.15		0.0091	0.043	mg/Kg-dry	256197	10
gamma-Chlordane	0.035		0.0088	0.022	mg/Kg-dry	256197	10
PERCENT MOISTURE D2216							
Percent Moisture	23.1		0	0	wt%	R363742	1
Client Sample ID: C9 (0-1) 021418				**Lab ID:** 1802E95-057			
Collection Date: 2/14/2018 2:25:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	24.6		3.09	21.5	mg/Kg-dry	256077	50
Copper	81.3		3.64	7.17	mg/Kg-dry	256077	50
Lead	301		2.05	3.58	mg/Kg-dry	256077	50
Zinc	359		3.59	35.8	mg/Kg-dry	256077	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.23		0.011	0.057	mg/Kg-dry	256197	10
4,4´-DDE	0.82		0.013	0.057	mg/Kg-dry	256197	10
4,4´-DDT	4.1		0.13	0.57	mg/Kg-dry	256197	100
alpha-BHC	0.16		0.014	0.028	mg/Kg-dry	256197	10
alpha-Chlordane	0.037		0.012	0.028	mg/Kg-dry	256197	10
beta-BHC	0.31		0.0091	0.028	mg/Kg-dry	256197	10
Dieldrin	0.36		0.012	0.057	mg/Kg-dry	256197	10
gamma-BHC	0.11		0.010	0.028	mg/Kg-dry	256197	10
gamma-Chlordane	0.065		0.011	0.028	mg/Kg-dry	256197	10
Toxaphene	4.5		0.14	2.8	mg/Kg-dry	256197	10
PERCENT MOISTURE D2216							
Percent Moisture	41.2		0	0	wt%	R363742	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256070

Sample ID: **MB-256070** Client ID: Units: **mg/L** Prep Date: **02/20/2018** Run No: **363736**
SampleType: **MBLK** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **256070** Analysis Date: **02/22/2018** Seq No: **8037858**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.00500									
Copper	BRL	0.00200									
Lead	BRL	0.00100									
Zinc	BRL	0.0100									

Sample ID: **LCS-256070** Client ID: Units: **mg/L** Prep Date: **02/20/2018** Run No: **363736**
SampleType: **LCS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **256070** Analysis Date: **02/22/2018** Seq No: **8037860**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09407	0.00500	0.1000		94.1	80	120				
Copper	0.09686	0.00200	0.1000		96.9	80	120				
Lead	0.09627	0.00100	0.1000		96.3	80	120				
Zinc	0.09281	0.0100	0.1000		92.8	80	120				

Sample ID: **1802E95-017AMS** Client ID: **EB-01-021318** Units: **mg/L** Prep Date: **02/20/2018** Run No: **363736**
SampleType: **MS** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **256070** Analysis Date: **02/22/2018** Seq No: **8037864**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09034	0.00500	0.1000		90.3	75	125				
Copper	0.09506	0.00200	0.1000		95.1	75	125				
Lead	0.09516	0.00100	0.1000		95.2	75	125				
Zinc	0.08972	0.0100	0.1000		89.7	75	125				

Sample ID: **1802E95-017AMSD** Client ID: **EB-01-021318** Units: **mg/L** Prep Date: **02/20/2018** Run No: **363736**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **256070** Analysis Date: **02/22/2018** Seq No: **8037866**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	0.09712	0.00500	0.1000		97.1	75	125	0.09034	7.24	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256070

Sample ID: **1802E95-017AMSD** Client ID: **EB-01-021318** Units: **mg/L** Prep Date: **02/20/2018** Run No: **363736**
SampleType: **MSD** TestCode: **Total Metals by ICP/MS SW6020B** BatchID: **256070** Analysis Date: **02/22/2018** Seq No: **8037866**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	0.1002	0.00200	0.1000		100	75	125	0.09506	5.22	20	
Lead	0.1024	0.00100	0.1000		102	75	125	0.09516	7.38	20	
Zinc	0.09514	0.0100	0.1000		95.1	75	125	0.08972	5.86	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256073

Sample ID: **MB-256073** Client ID: Units: **ug/Kg** Prep Date: **02/20/2018** Run No: **363652**
SampleType: **MBLK** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256073** Analysis Date: **02/21/2018** Seq No: **8035415**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-256073** Client ID: Units: **ug/Kg** Prep Date: **02/20/2018** Run No: **363652**
SampleType: **LCS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256073** Analysis Date: **02/21/2018** Seq No: **8035416**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	5046	5000	5000		101	80	120				
Copper	4865	100	5000		97.3	80	120				
Lead	5142	50.0	5000	37.41	102	80	120				
Zinc	4461	500	5000		89.2	80	120				

Sample ID: **1802E95-033AMS** Client ID: **E5 (0-1) 021318** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363652**
SampleType: **MS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256073** Analysis Date: **02/21/2018** Seq No: **8035418**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	204.6	36.7	4.898	195.8	180	75	125				S
Copper	345.7	4.90	4.898	250.0	1950	75	125				S
Lead	2375	2.45	4.898	2099	5630	75	125				S
Zinc	792.1	24.5	4.898	390.1	8210	75	125				S

Sample ID: **1802E95-033AMSD** Client ID: **E5 (0-1) 021318** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363652**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256073** Analysis Date: **02/21/2018** Seq No: **8035419**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	237.5	36.8	4.901	195.8	850	75	125	204.6	14.9	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256073

Sample ID: **1802E95-033AMSD** Client ID: **E5 (0-1) 021318** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363652**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256073** Analysis Date: **02/21/2018** Seq No: **8035419**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	470.7	4.90	4.901	250.0	4500	75	125	345.7	30.6	20	SR
Lead	2838	2.45	4.901	2099	15100	75	125	2375	17.8	20	S
Zinc	628.6	24.5	4.901	390.1	4870	75	125	792.1	23.0	20	SR

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256076

Sample ID: **MB-256076**	Client ID:			Units: **ug/Kg**	Prep Date: **02/20/2018**	Run No: **363653**
SampleType: **MBLK**	TestCode: **Metals by ICP/MS SW6020B**			BatchID: **256076**	Analysis Date: **02/22/2018**	Seq No: **8037711**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-256076**	Client ID:			Units: **ug/Kg**	Prep Date: **02/20/2018**	Run No: **363653**
SampleType: **LCS**	TestCode: **Metals by ICP/MS SW6020B**			BatchID: **256076**	Analysis Date: **02/21/2018**	Seq No: **8035511**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	4967	4900	5000		99.3	80	120				
Copper	4689	100	5000	53.45	92.7	80	120				
Lead	5176	50.0	5000	86.30	102	80	120				
Zinc	4283	500	5000		85.7	80	120				

Sample ID: **1802E95-039AMS**	Client ID: **F20 (0-1) 021418**			Units: **mg/Kg-dry**	Prep Date: **02/20/2018**	Run No: **363653**
SampleType: **MS**	TestCode: **Metals by ICP/MS SW6020B**			BatchID: **256076**	Analysis Date: **02/21/2018**	Seq No: **8035519**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	18.51	10.6	4.239	6.860	275	75	125				S
Copper	44.47	4.24	4.239	52.93	-199	75	125				S
Lead	109.5	2.12	4.239	80.19	690	75	125				S
Zinc	251.7	21.2	4.239	138.7	2670	75	125				S

Sample ID: **1802E95-039AMSD**	Client ID: **F20 (0-1) 021418**			Units: **mg/Kg-dry**	Prep Date: **02/20/2018**	Run No: **363653**
SampleType: **MSD**	TestCode: **Metals by ICP/MS SW6020B**			BatchID: **256076**	Analysis Date: **02/21/2018**	Seq No: **8035520**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	15.58	10.5	4.219	6.860	207	75	125	18.51	17.2	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256076

Sample ID: **1802E95-039AMSD** Client ID: **F20 (0-1) 021418** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363653**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256076** Analysis Date: **02/21/2018** Seq No: **8035520**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	42.87	4.22	4.219	52.93	-238	75	125	44.47	3.67	20	S
Lead	115.6	2.11	4.219	80.19	839	75	125	109.5	5.43	20	S
Zinc	223.7	21.1	4.219	138.7	2020	75	125	251.7	11.8	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256077

Sample ID: **MB-256077** Client ID: Units: **ug/Kg** Prep Date: **02/20/2018** Run No: **363654**
SampleType: **MBLK** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256077** Analysis Date: **02/21/2018** Seq No: **8035560**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-256077** Client ID: Units: **ug/Kg** Prep Date: **02/20/2018** Run No: **363654**
SampleType: **LCS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256077** Analysis Date: **02/21/2018** Seq No: **8035561**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	5032	5000	5000		101	80	120				
Copper	4854	100	5000		97.1	80	120				
Lead	5005	50.0	5000		100	80	120				
Zinc	4458	500	5000		89.2	80	120				

Sample ID: **1802E95-057AMS** Client ID: **C9 (0-1) 021418** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363654**
SampleType: **MS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256077** Analysis Date: **02/21/2018** Seq No: **8035563**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	27.47	18.0	7.208	24.55	40.5	75	125				S
Copper	66.12	7.21	7.208	81.32	-211	75	125				S
Lead	252.1	3.60	7.208	300.8	-675	75	125				S
Zinc	329.8	36.0	7.208	359.5	-411	75	125				S

Sample ID: **1802E95-057AMSD** Client ID: **C9 (0-1) 021418** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363654**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256077** Analysis Date: **02/21/2018** Seq No: **8035564**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	29.59	17.9	7.178	24.55	70.1	75	125	27.47	7.41	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256077

Sample ID: **1802E95-057AMSD** Client ID: **C9 (0-1) 021418** Units: **mg/Kg-dry** Prep Date: **02/20/2018** Run No: **363654**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **256077** Analysis Date: **02/21/2018** Seq No: **8035564**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	73.27	7.18	7.178	81.32	-112	75	125	66.12	10.3	20	S
Lead	281.3	3.59	7.178	300.8	-271	75	125	252.1	11.0	20	S
Zinc	329.6	35.9	7.178	359.5	-415	75	125	329.8	0.051	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256091

Sample ID: **MB-256091** Client ID: Units: **mg/L** Prep Date: **02/20/2018** Run No: **363846**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **256091** Analysis Date: **02/21/2018** Seq No: **8040718**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	0.00010									
4,4´-DDE	BRL	0.00010									
4,4´-DDT	BRL	0.00010									
alpha-BHC	BRL	0.000050									
alpha-Chlordane	BRL	0.000050									
beta-BHC	BRL	0.000050									
delta-BHC	BRL	0.000050									
Dieldrin	BRL	0.00010									
gamma-BHC	BRL	0.000050									
gamma-Chlordane	BRL	0.000050									
Heptachlor	BRL	0.000050									
Methoxychlor	BRL	0.00050									
Toxaphene	BRL	0.0050									
Surr: Decachlorobiphenyl	0.000312	0	0.0005		62.3	15.4	120				
Surr: Tetrachloro-m-xylene	0.000295	0	0.0005		59.0	37	126				

Sample ID: **LCS-256091** Client ID: Units: **mg/L** Prep Date: **02/20/2018** Run No: **363913**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **256091** Analysis Date: **02/26/2018** Seq No: **8042185**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000762	0.00010	0.0010		76.2	61.9	135				
Dieldrin	0.000795	0.00010	0.0010		79.5	70.3	126				
gamma-BHC	0.000834	0.000050	0.0010		83.4	70.9	129				
Heptachlor	0.000814	0.000050	0.0010		81.4	63.5	128				
Surr: Decachlorobiphenyl	0.000316	0	0.0005		63.3	15.4	120				
Surr: Tetrachloro-m-xylene	0.000358	0	0.0005		71.5	37	126				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256091

Sample ID: **1802E95-017BMS**	Client ID: **EB-01-021318**	Units: **mg/L**	Prep Date: **02/20/2018**	Run No: **363846**
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **256091**	Analysis Date: **02/21/2018**	Seq No: **8040721**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000681	0.00010	0.0010		68.1	43.2	136				
Dieldrin	0.000806	0.00010	0.0010		80.6	44	139				
gamma-BHC	0.000787	0.000050	0.0010		78.7	53.8	141				
Heptachlor	0.000816	0.000050	0.0010		81.6	34.3	144				
Surr: Decachlorobiphenyl	0.000246	0	0.0005		49.2	15.4	120				
Surr: Tetrachloro-m-xylene	0.000412	0	0.0005		82.4	37	126				

Sample ID: **1802E95-017BMSD**	Client ID: **EB-01-021318**	Units: **mg/L**	Prep Date: **02/20/2018**	Run No: **363846**
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**	BatchID: **256091**	Analysis Date: **02/21/2018**	Seq No: **8040722**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.000707	0.00010	0.0010		70.7	43.2	136	0.0006811	3.74	21.1	
Dieldrin	0.000815	0.00010	0.0010		81.5	44	139	0.0008062	1.03	20	
gamma-BHC	0.000758	0.000050	0.0010		75.8	53.8	141	0.0007866	3.76	20	
Heptachlor	0.000773	0.000050	0.0010		77.3	34.3	144	0.0008163	5.41	24.4	
Surr: Decachlorobiphenyl	0.000201	0	0.0005		40.1	15.4	120	0.0002462	0	0	
Surr: Tetrachloro-m-xylene	0.000332	0	0.0005		66.3	37	126	0.0004119	0	0	

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256093

Sample ID: **MB-256093** Client ID: Units: **ug/Kg** Prep Date: **02/20/2018** Run No: **363815**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **256093** Analysis Date: **02/20/2018** Seq No: **8040600**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	13.49	0	16.67		81.0	45	128				
Surr: Tetrachloro-m-xylene	13.04	0	16.67		78.3	46	120				

Sample ID: **LCS-256093** Client ID: Units: **ug/Kg** Prep Date: **02/20/2018** Run No: **363815**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **256093** Analysis Date: **02/20/2018** Seq No: **8040601**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	26.96	3.3	33.33		80.9	69.4	124				
Dieldrin	24.94	3.3	33.33		74.8	67.8	120				
gamma-BHC	25.38	1.7	33.33		76.1	68.2	118				
Heptachlor	26.43	1.7	33.33		79.3	61.8	121				
Surr: Decachlorobiphenyl	12.84	0	16.67		77.0	45	128				
Surr: Tetrachloro-m-xylene	11.64	0	16.67		69.8	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256093

Sample ID: **1802E95-033BMS**	Client ID: **E5 (0-1) 021318**				Units: **mg/Kg-dry**		Prep Date: **02/20/2018**		Run No: **363815**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **256093**		Analysis Date: **02/20/2018**		Seq No: **8040617**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.8912	0.090	0.0452	1.538	-1430	42.2	125				S
Dieldrin	0.1093	0.090	0.0452	0.2087	-220	50.4	120				S
gamma-BHC	BRL	0.045	0.0452	0.03520	-3.68	50.3	120				S
Heptachlor	BRL	0.045	0.0452		48.2	50.2	119				S
Surr: Decachlorobiphenyl	0.01313	0	0.0226		58.1	45	128				
Surr: Tetrachloro-m-xylene	0.01342	0	0.0226		59.4	46	120				

Sample ID: **1802E95-033BMSD**	Client ID: **E5 (0-1) 021318**				Units: **mg/Kg-dry**		Prep Date: **02/20/2018**		Run No: **363815**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **256093**		Analysis Date: **02/20/2018**		Seq No: **8040618**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.5844	0.090	0.0452	1.538	-2110	42.2	125	0.8912	41.6	24.1	SR
Dieldrin	BRL	0.090	0.0452	0.2087	-277	50.4	120	0.1093	0	33.1	S
gamma-BHC	BRL	0.045	0.0452	0.03520	-6.68	50.3	120	0.03353	0	25.3	S
Heptachlor	BRL	0.045	0.0452		55.4	50.2	119	0.02177	0	26.3	
Surr: Decachlorobiphenyl	0.01194	0	0.0226		52.8	45	128	0.01313	0	0	
Surr: Tetrachloro-m-xylene	0.01380	0	0.0226		61.1	46	120	0.01342	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256094

Sample ID: **MB-256094** Client ID: Units: **ug/Kg** Prep Date: **02/21/2018** Run No: **363846**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **256094** Analysis Date: **02/21/2018** Seq No: **8040724**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	14.11	0	16.67		84.7	45	128				
Surr: Tetrachloro-m-xylene	7.368	0	16.67		44.2	46	120				S

Sample ID: **LCS-256094** Client ID: Units: **ug/Kg** Prep Date: **02/21/2018** Run No: **363913**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **256094** Analysis Date: **02/26/2018** Seq No: **8042186**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	26.69	3.3	33.33		80.1	69.4	124				
Dieldrin	24.91	3.3	33.33		74.7	67.8	120				
gamma-BHC	24.53	1.7	33.33		73.6	68.2	118				
Heptachlor	26.25	1.7	33.33		78.7	61.8	121				
Surr: Decachlorobiphenyl	13.24	0	16.67		79.4	45	128				
Surr: Tetrachloro-m-xylene	11.51	0	16.67		69.0	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256094

Sample ID: **1802E95-039BMS**	Client ID: **F20 (0-1) 021418**				Units: **mg/Kg-dry**		Prep Date: **02/21/2018**		Run No: **364023**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **256094**		Analysis Date: **02/27/2018**		Seq No: **8045119**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.06713	0.041	0.0408	0.05502	29.7	42.2	125				S
Dieldrin	BRL	0.041	0.0408		74.4	50.4	120				
gamma-BHC	0.02849	0.020	0.0408		69.9	50.3	120				
Heptachlor	0.02731	0.020	0.0408		67.0	50.2	119				
Surr: Decachlorobiphenyl	0.01446	0	0.0204		71.0	45	128				
Surr: Tetrachloro-m-xylene	0.01395	0	0.0204		68.5	46	120				

Sample ID: **1802E95-039BMSD**	Client ID: **F20 (0-1) 021418**				Units: **mg/Kg-dry**		Prep Date: **02/21/2018**		Run No: **364023**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **256094**		Analysis Date: **02/27/2018**		Seq No: **8045120**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.06377	0.041	0.0408	0.05502	21.5	42.2	125	0.06713	5.14	24.1	S
Dieldrin	BRL	0.041	0.0408		69.3	50.4	120	0.03031	0	33.1	
gamma-BHC	0.02860	0.020	0.0408		70.2	50.3	120	0.02849	0.385	25.3	
Heptachlor	0.02735	0.020	0.0408		67.1	50.2	119	0.02731	0.149	26.3	
Surr: Decachlorobiphenyl	0.01387	0	0.0204		68.0	45	128	0.01446	0	0	
Surr: Tetrachloro-m-xylene	0.01352	0	0.0204		66.4	46	120	0.01395	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256197

Sample ID: **MB-256197**	Client ID:		Units: **ug/Kg**	Prep Date: **02/21/2018**	Run No: **363673**
SampleType: **MBLK**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**		BatchID: **256197**	Analysis Date: **02/21/2018**	Seq No: **8036088**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	15.15	0	16.67		90.9	45	128				
Surr: Tetrachloro-m-xylene	13.01	0	16.67		78.1	46	120				

Sample ID: **MB-256197**	Client ID:		Units: **ug/Kg**	Prep Date: **02/21/2018**	Run No: **363716**
SampleType: **MBLK**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**		BatchID: **256197**	Analysis Date: **02/22/2018**	Seq No: **8040637**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256197

Sample ID: **MB-256197**	Client ID:			Units: **ug/Kg**	Prep Date: **02/21/2018**	Run No: **363716**
SampleType: **MBLK**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**			BatchID: **256197**	Analysis Date: **02/22/2018**	Seq No: **8040637**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	17.36	0	16.67		104	45	128				
Surr: Tetrachloro-m-xylene	13.62	0	16.67		81.7	46	120				

Sample ID: **LCS-256197**	Client ID:			Units: **ug/Kg**	Prep Date: **02/21/2018**	Run No: **363673**
SampleType: **LCS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**			BatchID: **256197**	Analysis Date: **02/21/2018**	Seq No: **8036092**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	31.21	3.3	33.33		93.6	69.4	124				
Dieldrin	27.12	3.3	33.33		81.4	67.8	120				
gamma-BHC	27.88	1.7	33.33		83.6	68.2	118				
Heptachlor	29.32	1.7	33.33		88.0	61.8	121				
Surr: Decachlorobiphenyl	14.86	0	16.67		89.1	45	128				
Surr: Tetrachloro-m-xylene	12.73	0	16.67		76.4	46	120				

Sample ID: **LCS-256197**	Client ID:			Units: **ug/Kg**	Prep Date: **02/21/2018**	Run No: **363716**
SampleType: **LCS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**			BatchID: **256197**	Analysis Date: **02/22/2018**	Seq No: **8040638**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	31.58	3.3	33.33		94.8	69.4	124				
Dieldrin	28.52	3.3	33.33		85.6	67.8	120				
gamma-BHC	28.93	1.7	33.33		86.8	68.2	118				
Heptachlor	31.09	1.7	33.33		93.3	61.8	121				
Surr: Decachlorobiphenyl	16.04	0	16.67		96.2	45	128				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802E95

ANALYTICAL QC SUMMARY REPORT

BatchID: 256197

Sample ID: **LCS-256197**	Client ID:			Units: **ug/Kg**	Prep Date: **02/21/2018**	Run No: **363716**
SampleType: **LCS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**			BatchID: **256197**	Analysis Date: **02/22/2018**	Seq No: **8040638**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: Tetrachloro-m-xylene	13.14	0	16.67		78.8	46	120				

Sample ID: **1802H84-001BMS**	Client ID:			Units: **mg/Kg-dry**	Prep Date: **02/21/2018**	Run No: **363673**
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**			BatchID: **256197**	Analysis Date: **02/21/2018**	Seq No: **8036100**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.03608	0.0041	0.0407	0.001125	85.8	42.2	125				
Dieldrin	0.03122	0.0041	0.0407		76.7	50.4	120				
gamma-BHC	0.03147	0.0020	0.0407		77.3	50.3	120				
Heptachlor	0.03278	0.0020	0.0407		80.5	50.2	119				
Surr: Decachlorobiphenyl	0.01658	0	0.0204		81.4	45	128				
Surr: Tetrachloro-m-xylene	0.01403	0	0.0204		68.9	46	120				

Sample ID: **1802H84-001BMSD**	Client ID:			Units: **mg/Kg-dry**	Prep Date: **02/21/2018**	Run No: **363673**
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**			BatchID: **256197**	Analysis Date: **02/21/2018**	Seq No: **8036102**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.03550	0.0041	0.0407	0.001125	84.4	42.2	125	0.03608	1.62	24.1	
Dieldrin	0.03221	0.0041	0.0407		79.1	50.4	120	0.03122	3.11	33.1	
gamma-BHC	0.03274	0.0020	0.0407		80.4	50.3	120	0.03147	3.95	25.3	
Heptachlor	0.03340	0.0020	0.0407		82.0	50.2	119	0.03278	1.87	26.3	
Surr: Decachlorobiphenyl	0.01674	0	0.0204		82.2	45	128	0.01658	0	0	
Surr: Tetrachloro-m-xylene	0.01493	0	0.0204		73.3	46	120	0.01403	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

February 21, 2018

Rhonda Quinn
AMEC Foster Wheeler

1075 Big Shanty Rd NW
Kennesaw GA 30144

RE: BFEL - Atlanta

Dear Rhonda Quinn: Order No: 1802987

Analytical Environmental Services, Inc. received 89 samples on 2/10/2018 1:10:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAP/State of Florida Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions Volatile Organics, and Drinking Water Microbiology & Metals, effective 07/01/17-06/30/18.
State of Georgia, Department of Natural Resources ID #800 for analysis of Drinking Water Metals, effective 07/01/17-06/30/18 and Total Coliforms/ E. coli, effective 04/25/17-04/24/20.
-NELAP/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/17-06/30/18.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 11/01/19.
These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Ioana Pacurar

Ioana Pacurar

Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive; Atlanta, GA 30340
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 1 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)								No # of Containers
							PRESERVATION (See codes)									REMARKS
							I	I								
1	C32 (0-1) 020618	02/06/18	1124	X		SO	X	X								2
2	C31 (0-1) 020618	02/06/18	1125	X		SO	X	X								2
3	D31 (0-1) 020618	02/06/18	1135	X		SO	X	X								2
4	C30 (0-1) 020618	02/06/18	1203	X		SO	X	X								2
5	D30 (0-1) 020618	02/06/18	1350	X		SO	X	X								2
6	D32 (0-1) 020618	02/06/18	1358	X		SO	X	X								2
7	E30 (0-1) 020618	02/06/18	1400	X		SO	X	X								2
8	D33 (0-1) 020618	02/06/18	1402	X		SO	X	X								2
9	E29 (0-1) 020618	02/06/18	1410	X		SO	X	X								2
10	E28 (0-1) 020618	02/06/18	1425	X		SO	X	X								2
11	E31 (0-1) 020618	02/06/18	1432	X		SO	X	X								2
12	D34 (0-1) 020618	02/06/18	1434	X		SO	X	X								2
13	E32 (0-1) 020618	02/06/18	1510	X		SO	X	X								2
14	E33 (0-1) 020618	02/06/18	1510	X		SO	X	X								2

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1205	1:	2-10-18 12:05
2:	2-10-18 1:10	2:	2/10/18 1:10
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 28

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other_____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive; Atlanta, GA 30340
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 2 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)							No # of Containers
							PRESERVATION (See codes)								REMARKS
							I	I							
1	E27 (0-1) 020618	02/06/18	1530	X		SO	X	X							2
2	D27 (0-1) 020618	02/06/18	1541	X		SO	X	X							2
3	E26 (0-1) 020618	02/06/18	1545	X		SO	X	X							2
4	C29 (0-1) 020618	02/06/18	1547	X		SO	X	X							2
5	D28 (0-1) 020618	02/06/18	1555	X		SO	X	X							2
6	E25 (0-1) 020618	02/06/18	1605	X		SO	X	X							2
7	D29 (0-1) 020618	02/06/18	1610	X		SO	X	X							2
8	C28 (0-1) 020618	02/06/18	1616	X		SO	X	X							2
9	C27 (0-1) 020618	02/06/18	1641	X		SO	X	X							2
10	D26 (0-1) 020818	02/08/18	1038	X		SO	X	X							2
11	D25 (0-1) 020818	02/08/18	1049	X		SO	X	X							2
12	C26 (0-1) 020818	02/08/18	1052	X		SO	X	X							2
13	E24 (0-1) 020818	02/08/18	1100	X		SO	X	X							2
14	D24 (0-1) 020818	02/08/18	1102	X		SO	X	X							2

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RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1205	1:	2-10-18 12:07
2:	2-10-18 1:10	2:	2/10/18 1:10pm
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 28

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

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CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 3 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)								No # of Containers
							PRESERVATION (See codes)									
							I	I								
1	C25 (0-1) 020818	02/08/18	1106	X		SO	X	X								2
2	D23 (0-1) 020818	02/08/18	1118	X		SO	X	X								2
3	E23 (0-1) 020818	02/08/18	1120	X		SO	X	X								2
4	C24 (0-1) 020818	02/08/18	1125	X		SO	X	X								2
5	D22 (0-1) 020818	02/08/18	1134	X		SO	X	X								2
6	C23 (0-1) 020818	02/08/18	1144	X		SO	X	X								2
7	B22 (0-1) 020818	02/08/18	1225	X		SO	X	X								2
8	B23 (0-1) 020818	02/08/18	1250	X		SO	X	X								2
9	B24 (0-1) 020818	02/08/18	1310	X		SO	X	X								2
10	D21 (0-1) 020818	02/08/18	1334	X		SO	X	X								2
11	B25 (0-1) 020818	02/08/18	1335	X		SO	X	X								2
12	D20 (0-1) 020818	02/08/18	1346	X		SO	X	X								2
13	C22 (0-1) 020818	02/08/18	1357	X		SO	X	X								2
14	D19 (0-1) 020818	02/08/18	1402	X		SO	X	X								2

ANALYSIS REQUESTED

REMARKS

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RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1105	1:	2-10-18 13:05
2:	2-10-18 1:10	2:	2/10/18 1:10
3:		3:	

PROJECT INFORMATION

PROJECT NAME:	BFEL - Atlanta
PROJECT #:	6122080154.27
SITE ADDRESS:	Atlanta, Georgia
SEND REPORT TO:	Greg Wrenn
COPY REPORT TO:	Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)	
QUOTE #:	PO#:

RECEIPT

Total # of Containers: 28

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS:
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SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

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CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 4 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)	MS/MSD							REMARKS	No # of Containers
							PRESERVATION (See codes)										
							I	I	I								
1	B26 (0-1) 020818	02/08/18	1405	X		SO	X	X									2
2	C21 (0-1) 020818	02/08/18	1410	X		SO	X	X									2
3	C20 (0-1) 020818	02/08/18	1425	X		SO	X	X									2
4	D18 (0-1) 020818	02/08/18	1428	X		SO	X	X									2
5	D18 (0-1) 020818 MS/MSD	02/08/18	1428	X		SO			X								3
6	B27 (0-1) 020818	02/08/18	1435	X		SO	X	X									2
7	C19 (0-1) 020818	02/08/18	1446	X		SO	X	X									2
8	D16 (0-1) 020818	02/08/18	1450	X		SO	X	X									2
9	C18 (0-1) 020818	02/08/18	1503	X		SO	X	X									2
10	D15 (0-1) 020818	02/08/18	1504	X		SO	X	X									2
11	B28 (0-1) 020818	02/08/18	1505	X		SO	X	X									2
12	C17 (0-1) 020818	02/08/18	1521	X		SO	X	X									2
13	B29 (0-1) 020818	02/08/18	1535	X		SO	X	X									2
14	C16 (0-1) 020818	02/08/18	1540	X		SO	X	X									2

ANALYSIS REQUESTED

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RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1205	1:	2-10-18 12:05
2:	2-10-18 1:10	2:	2/10/18 1:10
3:		3:	

PROJECT INFORMATION

PROJECT NAME:	BFEL - Atlanta
PROJECT #:	6122080154.27
SITE ADDRESS:	Atlanta, Georgia
SEND REPORT TO:	Greg Wrenn
COPY REPORT TO:	Kenneth Nye, Rhonda Quinn
INVOICE TO: (IF DIFFERENT FROM ABOVE)	
QUOTE #:	PO#:

RECEIPT

Total # of Containers: 29

Turnaround Time Request
- (●) Standard 5 Business Days
- ( ) 2 Business Day Rush
- ( ) Next Business Day Rush
- ( ) Same Day Rush (auth req.)
- ( ) Other

STATE PROGRAM (if any):
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS:
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SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

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CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 5 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)								No # of Containers
							PRESERVATION (See codes)									REMARKS
							I	I								
1	C15 (0-1) 020818	02/08/18	1556	X		SO	X	X								2
2	A22 (0-1) 020918	02/09/18	0850	X		SO	X	X								2
3	D17 (0-1) 020918	02/09/18	0900	X		SO	X	X								2
4	A23 (0-1) 020918	02/09/18	0915	X		SO	X	X								2
5	E22 (0-1) 020918	02/09/18	0933	X		SO	X	X								2
6	A24 (0-1) 020918	02/09/18	0940	X		SO	X	X								2
7	E21 (0-1) 020918	02/09/18	0943	X		SO	X	X								2
8	E20 (0-1) 020918	02/09/18	0956	X		SO	X	X								2
9	E19 (0-1) 020918	02/09/18	1010	X		SO	X	X								2
10	A25 (0-1) 020918	02/09/18	1020	X		SO	X	X								2
11	E18 (0-1) 020918	02/09/18	1022	X		SO	X	X								2
12	A26 (0-1) 020918	02/09/18	1045	X		SO	X	X								2
13	D14 (0-1) 020918	02/09/18	1130	X		SO	X	X								2
14	D13 (0-1) 020918	02/09/18	1150	X		SO	X	X								2

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RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1205	1:	2-10-18 12:05
2:	2-10-18 1:10	2:	2/10/18 1:10
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 28

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other_____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive; Atlanta, GA 30340
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 6 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)								No # of Containers
							PRESERVATION (See codes)									
							I	I								
1	E17 (0-1) 020918	02/09/18	1156	X		SO	X	X								2
2	E16 (0-1) 020918	02/09/18	1205	X		SO	X	X								2
3	D12 (0-1) 020918	02/09/18	1210	X		SO	X	X								2
4	E15 (0-1) 020918	02/09/18	1227	X		SO	X	X								2
5	D10 (0-1) 020918	02/09/18	1240	X		SO	X	X								2
6	E14 (0-1) 020918	02/09/18	1252	X		SO	X	X								2
7	E13 (0-1) 020918	02/09/18	1304	X		SO	X	X								2
8	D11 (0-1) 020918	02/09/18	1310	X		SO	X	X								2
9	E12 (0-1) 020918	02/09/18	1334	X		SO	X	X								2
10	B10 (0-1) 020918	02/09/18	1340	X		SO	X	X								2
11	E11 (0-1) 020918	02/09/18	1342	X		SO	X	X								2
12	E10 (0-1) 020918	02/09/18	1400	X		SO	X	X								2
13	B11 (0-1) 020918	02/09/18	1405	X		SO	X	X								2
14	E9 (0-1) 020918	02/09/18	1420	X		SO	X	X								2

ANALYSIS REQUESTED

REMARKS

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1205	1:	2-10-18 12:05
2:	2-10-18 1:10	2:	2/10/18 1:10
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 28

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other_____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
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MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive; Atlanta, GA 30340
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CHAIN OF CUSTODY

Work Order: 1802987

Date: 02/10/2018 Page 7 of 7

COMPANY:	ADDRESS:
Wood	1075 Big Shanty Rd NW Suite 100 Kennesaw, GA 30144
PHONE: 770-421-3400	FAX:
SAMPLED BY: Kenneth Nye, Daniel Howard, Ever Guillen	SIGNATURE:

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Select Metals (6020)	Select Organochlorine Pesticides (8081A)	MS/MSD						No # of Containers
							PRESERVATION (See codes)								REMARKS
							I	I	I						
1	C14 (0-1) 020918	02/09/18	1423	X		SO	X	X							2
2	B12 (0-1) 020918	02/09/18	1435	X		SO	X	X							2
3	C13 (0-1) 020918	02/09/18	1448	X		SO	X	X							2
4	C12 (0-1) 020918	02/09/18	1514	X		SO	X	X							2
5	C11 (0-1) 020918	02/09/18	1539	X		SO	X	X							2
6	C8 (0-1) 020918	02/09/18	1642	X		SO	X	X							2
7	C8 (0-1) 020918 MS/MSD	02/09/18	1642	X		SO			X						3
8															
9															
10															
11															
12															
13															
14															

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	02/10/18 1205	1:	2-10-18 1205
2:	2-10-18 2:10	2:	2/10/18 1510
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Analytes to be reported for each analysis were provided to AES PM (Ioana Pacurar) on 02/01/2018 via email.

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: BFEL - Atlanta
PROJECT #: 6122080154.27
SITE ADDRESS: Atlanta, Georgia
SEND REPORT TO: Greg Wrenn
COPY REPORT TO: Kenneth Nye, Rhonda Quinn
INVOICE TO:
(IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 15

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
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MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

Client: AMEC Foster Wheeler
Project: BFEL - Atlanta
Lab ID: 1802987

Case Narrative

Pesticide Analysis by Method 8081B:

Due to sample matrix, all samples in workorder 1802987 required dilution during analysis resulting in elevated reporting limits. Furthermore, the MBLK (Method Blank) and LCS (Laboratory Control Sample) is reported in ug/kg on the Analytical QC Summary Report, while the final results, MS (Matrix Spike) and MSD (Matrix Spike Duplicate) are all reported in mg/kg-dry for Pesticide Analysis by Method 8081B.

Metals Analysis by Method 6020B:

Due to sample matrix, samples 1802987-021A, 25A, 29A, 30A, 32A, and 77A required dilution during preparation and/or analysis resulting in elevated reporting limits. Furthermore, the MBLK (Method Blank) and LCS (Laboratory Control Sample) is reported in ug/kg on the Analytical QC Summary Report, while the final results, MS (Matrix Spike) and MSD (Matrix Spike Duplicate) are all reported in mg/kg-dry for Metals Analysis by Method 6020B.

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C32 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 11:24:00 AM
Lab ID:	1802987-001	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	68.5	9.20		mg/Kg-dry	255704	50	02/16/2018 12:20	DP
Copper	52.0	6.13		mg/Kg-dry	255704	50	02/16/2018 12:20	DP
Lead	997	3.07		mg/Kg-dry	255704	50	02/16/2018 12:20	DP
Zinc	189	30.7		mg/Kg-dry	255704	50	02/16/2018 12:20	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.023		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
4,4´-DDE	0.053	0.023		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
4,4´-DDT	0.037	0.023		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
alpha-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
alpha-Chlordane	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
beta-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
delta-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
Dieldrin	BRL	0.023		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
gamma-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
gamma-Chlordane	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
Heptachlor	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
Methoxychlor	BRL	0.11		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
Toxaphene	BRL	1.1		mg/Kg-dry	255725	5	02/14/2018 16:32	RS
Surr: Decachlorobiphenyl	76.8	45-128		%REC	255725	5	02/14/2018 16:32	RS
Surr: Tetrachloro-m-xylene	63.2	46-120		%REC	255725	5	02/14/2018 16:32	RS
PERCENT MOISTURE D2216								
Percent Moisture	26.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C31 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 11:25:00 AM
Lab ID:	1802987-002	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	26.2	7.86		mg/Kg-dry	255704	50	02/16/2018 19:23	DP
Copper	37.8	5.24		mg/Kg-dry	255704	50	02/16/2018 19:23	DP
Lead	295	2.62		mg/Kg-dry	255704	50	02/16/2018 12:55	DP
Zinc	134	26.2		mg/Kg-dry	255704	50	02/16/2018 19:23	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.023		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
4,4´-DDE	BRL	0.023		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
4,4´-DDT	BRL	0.023		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
alpha-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
alpha-Chlordane	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
beta-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
delta-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
Dieldrin	BRL	0.023		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
gamma-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
gamma-Chlordane	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
Heptachlor	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
Methoxychlor	BRL	0.11		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
Toxaphene	BRL	1.1		mg/Kg-dry	255725	5	02/14/2018 16:48	RS
Surr: Decachlorobiphenyl	80	45-128		%REC	255725	5	02/14/2018 16:48	RS
Surr: Tetrachloro-m-xylene	66.4	46-120		%REC	255725	5	02/14/2018 16:48	RS
PERCENT MOISTURE D2216								
Percent Moisture	27.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D31 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 11:35:00 AM
Lab ID:	1802987-003	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.27		mg/Kg-dry	255704	100	02/16/2018 20:04	DP
Copper	29.7	11.2		mg/Kg-dry	255704	100	02/16/2018 20:04	DP
Lead	156	2.79		mg/Kg-dry	255704	50	02/16/2018 12:57	DP
Zinc	554	55.9		mg/Kg-dry	255704	100	02/16/2018 20:04	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.48		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
4,4´-DDE	BRL	0.48		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
4,4´-DDT	BRL	0.48		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
alpha-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
alpha-Chlordane	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
beta-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
delta-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
Dieldrin	BRL	0.48		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
gamma-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
gamma-Chlordane	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
Heptachlor	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
Methoxychlor	BRL	2.4		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
Toxaphene	BRL	24		mg/Kg-dry	255725	100	02/17/2018 05:25	RS
Surr: Decachlorobiphenyl	121	45-128		%REC	255725	100	02/17/2018 05:25	RS
Surr: Tetrachloro-m-xylene	97.6	46-120		%REC	255725	100	02/17/2018 05:25	RS
PERCENT MOISTURE D2216								
Percent Moisture	31.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C30 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 12:03:00 PM
Lab ID:	1802987-004	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.14		mg/Kg-dry	255704	100	02/16/2018 20:06	DP
Copper	5.77	4.89		mg/Kg-dry	255704	100	02/16/2018 20:06	DP
Lead	49.7	2.44		mg/Kg-dry	255704	50	02/16/2018 12:58	DP
Zinc	68.6	48.9		mg/Kg-dry	255704	100	02/16/2018 20:06	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0092		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
4,4´-DDE	BRL	0.0092		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
4,4´-DDT	BRL	0.0092		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
alpha-BHC	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
alpha-Chlordane	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
beta-BHC	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
delta-BHC	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
Dieldrin	BRL	0.0092		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
gamma-BHC	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
gamma-Chlordane	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
Heptachlor	BRL	0.0046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
Methoxychlor	BRL	0.046		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
Toxaphene	BRL	0.46		mg/Kg-dry	255725	2	02/14/2018 16:00	RS
Surr: Decachlorobiphenyl	84	45-128		%REC	255725	2	02/14/2018 16:00	RS
Surr: Tetrachloro-m-xylene	66.3	46-120		%REC	255725	2	02/14/2018 16:00	RS
PERCENT MOISTURE D2216								
Percent Moisture	27.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D30 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 1:50:00 PM
Lab ID:	1802987-005	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	13.4	7.71		mg/Kg-dry	255704	50	02/16/2018 13:00	DP
Copper	22.4	4.82		mg/Kg-dry	255704	50	02/16/2018 13:00	DP
Lead	270	2.41		mg/Kg-dry	255704	50	02/16/2018 13:00	DP
Zinc	122	24.1		mg/Kg-dry	255704	50	02/16/2018 13:00	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.022		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
4,4´-DDE	0.086	0.022		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
4,4´-DDT	0.065	0.022		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
alpha-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
alpha-Chlordane	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
beta-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
delta-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
Dieldrin	BRL	0.022		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
gamma-BHC	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
gamma-Chlordane	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
Heptachlor	BRL	0.011		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
Methoxychlor	BRL	0.11		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
Toxaphene	BRL	1.1		mg/Kg-dry	255725	5	02/14/2018 17:04	RS
Surr: Decachlorobiphenyl	89.9	45-128		%REC	255725	5	02/14/2018 17:04	RS
Surr: Tetrachloro-m-xylene	80.3	46-120		%REC	255725	5	02/14/2018 17:04	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D32 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 1:58:00 PM
Lab ID:	1802987-006	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.48		mg/Kg-dry	255704	50	02/16/2018 19:25	DP
Copper	22.1	5.12		mg/Kg-dry	255704	50	02/16/2018 19:25	DP
Lead	222	2.56		mg/Kg-dry	255704	50	02/16/2018 13:02	DP
Zinc	533	25.6		mg/Kg-dry	255704	50	02/16/2018 19:25	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.47		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
4,4´-DDE	BRL	0.47		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
4,4´-DDT	BRL	0.47		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
alpha-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
alpha-Chlordane	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
beta-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
delta-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
Dieldrin	BRL	0.47		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
gamma-BHC	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
gamma-Chlordane	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
Heptachlor	BRL	0.24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
Methoxychlor	BRL	2.4		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
Toxaphene	BRL	24		mg/Kg-dry	255725	100	02/17/2018 05:09	RS
Surr: Decachlorobiphenyl	244	45-128	S	%REC	255725	100	02/17/2018 05:09	RS
Surr: Tetrachloro-m-xylene	86	46-120		%REC	255725	100	02/17/2018 05:09	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.0	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E30 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 2:00:00 PM
Lab ID:	1802987-007	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	8.02	7.67		mg/Kg-dry	255704	50	02/16/2018 13:04	DP
Copper	23.6	4.79		mg/Kg-dry	255704	50	02/16/2018 13:04	DP
Lead	353	2.40		mg/Kg-dry	255704	50	02/16/2018 13:04	DP
Zinc	747	24.0		mg/Kg-dry	255704	50	02/16/2018 13:04	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.45		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
4,4´-DDE	BRL	0.45		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
4,4´-DDT	BRL	0.45		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
alpha-BHC	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
alpha-Chlordane	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
beta-BHC	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
delta-BHC	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
Dieldrin	BRL	0.45		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
gamma-BHC	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
gamma-Chlordane	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
Heptachlor	BRL	0.23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
Methoxychlor	BRL	2.3		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
Toxaphene	BRL	23		mg/Kg-dry	255725	100	02/17/2018 05:41	RS
Surr: Decachlorobiphenyl	133	45-128	S	%REC	255725	100	02/17/2018 05:41	RS
Surr: Tetrachloro-m-xylene	102	46-120		%REC	255725	100	02/17/2018 05:41	RS
PERCENT MOISTURE D2216								
Percent Moisture	25.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D33 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 2:02:00 PM
Lab ID:	1802987-008	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	12.9	8.15		mg/Kg-dry	255704	100	02/16/2018 20:08	DP
Copper	24.3	9.06		mg/Kg-dry	255704	100	02/16/2018 20:08	DP
Lead	210	2.27		mg/Kg-dry	255704	50	02/16/2018 13:06	DP
Zinc	192	45.3		mg/Kg-dry	255704	100	02/16/2018 20:08	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.47	0.43		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
4,4´-DDE	0.70	0.43		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
4,4´-DDT	8.0	0.43		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
alpha-BHC	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
alpha-Chlordane	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
beta-BHC	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
delta-BHC	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
Dieldrin	BRL	0.43		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
gamma-BHC	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
gamma-Chlordane	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
Heptachlor	BRL	0.22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
Methoxychlor	BRL	2.2		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
Toxaphene	BRL	22		mg/Kg-dry	255725	100	02/14/2018 18:56	RS
Surr: Decachlorobiphenyl	105	45-128		%REC	255725	100	02/14/2018 18:56	RS
Surr: Tetrachloro-m-xylene	94	46-120		%REC	255725	100	02/14/2018 18:56	RS
PERCENT MOISTURE D2216								
Percent Moisture	22.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E29 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 2:10:00 PM
Lab ID:	1802987-009	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	23.8	8.21		mg/Kg-dry	255704	50	02/16/2018 13:08	DP
Copper	44.0	5.47		mg/Kg-dry	255704	50	02/16/2018 13:08	DP
Lead	566	2.74		mg/Kg-dry	255704	50	02/16/2018 13:08	DP
Zinc	242	27.4		mg/Kg-dry	255704	50	02/16/2018 13:08	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.51		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
4,4´-DDE	1.3	0.51		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
4,4´-DDT	1.1	0.51		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
alpha-BHC	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
alpha-Chlordane	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
beta-BHC	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
delta-BHC	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
Dieldrin	BRL	0.51		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
gamma-BHC	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
gamma-Chlordane	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
Heptachlor	BRL	0.26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
Methoxychlor	BRL	2.6		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
Toxaphene	BRL	26		mg/Kg-dry	255725	100	02/17/2018 05:57	RS
Surr: Decachlorobiphenyl	99.4	45-128		%REC	255725	100	02/17/2018 05:57	RS
Surr: Tetrachloro-m-xylene	74.4	46-120		%REC	255725	100	02/17/2018 05:57	RS
PERCENT MOISTURE D2216								
Percent Moisture	34.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E28 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 2:25:00 PM
Lab ID:	1802987-010	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	41.7	15.1		mg/Kg-dry	255704	100	02/16/2018 20:10	DP
Copper	45.7	10.1		mg/Kg-dry	255704	100	02/16/2018 20:10	DP
Lead	1780	2.51		mg/Kg-dry	255704	50	02/16/2018 13:10	DP
Zinc	245	50.3		mg/Kg-dry	255704	100	02/16/2018 20:10	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.044		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
4,4´-DDE	0.14	0.044		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
4,4´-DDT	0.14	0.044		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
alpha-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
alpha-Chlordane	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
beta-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
delta-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
Dieldrin	BRL	0.044		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
gamma-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
gamma-Chlordane	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
Heptachlor	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
Methoxychlor	BRL	0.22		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
Toxaphene	BRL	2.2		mg/Kg-dry	255725	10	02/14/2018 17:20	RS
Surr: Decachlorobiphenyl	91.3	45-128		%REC	255725	10	02/14/2018 17:20	RS
Surr: Tetrachloro-m-xylene	73.8	46-120		%REC	255725	10	02/14/2018 17:20	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E31 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 2:32:00 PM
Lab ID:	1802987-011	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	8.09	7.55		mg/Kg-dry	255704	100	02/16/2018 20:12	DP
Copper	19.2	10.1		mg/Kg-dry	255704	100	02/16/2018 20:12	DP
Lead	102	2.52		mg/Kg-dry	255704	50	02/16/2018 13:12	DP
Zinc	198	50.3		mg/Kg-dry	255704	100	02/16/2018 20:12	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.047		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
4,4´-DDE	0.070	0.047		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
4,4´-DDT	0.16	0.047		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
alpha-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
alpha-Chlordane	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
beta-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
delta-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
Dieldrin	BRL	0.047		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
gamma-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
gamma-Chlordane	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
Heptachlor	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
Methoxychlor	BRL	0.24		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
Toxaphene	BRL	2.4		mg/Kg-dry	255725	10	02/14/2018 17:36	RS
Surr: Decachlorobiphenyl	89.6	45-128		%REC	255725	10	02/14/2018 17:36	RS
Surr: Tetrachloro-m-xylene	81.3	46-120		%REC	255725	10	02/14/2018 17:36	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D34 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 2:34:00 PM
Lab ID:	1802987-012	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	27.2	7.88		mg/Kg-dry	255704	50	02/16/2018 13:20	DP
Copper	28.7	4.64		mg/Kg-dry	255704	50	02/16/2018 13:20	DP
Lead	84.7	2.32		mg/Kg-dry	255704	50	02/16/2018 13:20	DP
Zinc	63.6	23.2		mg/Kg-dry	255704	50	02/16/2018 13:20	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0085		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
4,4´-DDE	0.038	0.0085		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
4,4´-DDT	0.014	0.0085		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
alpha-BHC	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
alpha-Chlordane	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
beta-BHC	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
delta-BHC	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
Dieldrin	BRL	0.0085		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
gamma-BHC	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
gamma-Chlordane	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
Heptachlor	BRL	0.0043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
Methoxychlor	BRL	0.043		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
Toxaphene	BRL	0.43		mg/Kg-dry	255725	2	02/14/2018 16:16	RS
Surr: Decachlorobiphenyl	79	45-128		%REC	255725	2	02/14/2018 16:16	RS
Surr: Tetrachloro-m-xylene	69.9	46-120		%REC	255725	2	02/14/2018 16:16	RS
PERCENT MOISTURE D2216								
Percent Moisture	21.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E32 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:10:00 PM
Lab ID:	1802987-013	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	11.4	7.93		mg/Kg-dry	255704	50	02/16/2018 13:21	DP
Copper	24.6	5.29		mg/Kg-dry	255704	50	02/16/2018 13:21	DP
Lead	399	2.64		mg/Kg-dry	255704	50	02/16/2018 13:21	DP
Zinc	890	26.4		mg/Kg-dry	255704	50	02/16/2018 13:21	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.099		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
4,4´-DDE	0.18	0.099		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
4,4´-DDT	0.65	0.099		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
alpha-BHC	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
alpha-Chlordane	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
beta-BHC	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
delta-BHC	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
Dieldrin	BRL	0.099		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
gamma-BHC	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
gamma-Chlordane	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
Heptachlor	BRL	0.050		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
Methoxychlor	BRL	0.50		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
Toxaphene	BRL	5.0		mg/Kg-dry	255725	20	02/16/2018 13:53	RS
Surr: Decachlorobiphenyl	11	45-128	S	%REC	255725	20	02/16/2018 13:53	RS
Surr: Tetrachloro-m-xylene	6.16	46-120	S	%REC	255725	20	02/16/2018 13:53	RS
PERCENT MOISTURE D2216								
Percent Moisture	32.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E33 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:10:00 PM
Lab ID:	1802987-014	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	10.8	8.21		mg/Kg-dry	255704	100	02/16/2018 20:13	DP
Copper	17.2	9.13		mg/Kg-dry	255704	100	02/16/2018 20:13	DP
Lead	120	2.28		mg/Kg-dry	255704	50	02/16/2018 13:23	DP
Zinc	127	45.6		mg/Kg-dry	255704	100	02/16/2018 20:13	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	10	4.2		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
4,4´-DDE	BRL	4.2		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
4,4´-DDT	340	42		mg/Kg-dry	255725	10000	02/17/2018 02:29	RS
alpha-BHC	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
alpha-Chlordane	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
beta-BHC	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
delta-BHC	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
Dieldrin	BRL	4.2		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
gamma-BHC	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
gamma-Chlordane	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
Heptachlor	BRL	2.1		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
Methoxychlor	BRL	210		mg/Kg-dry	255725	10000	02/17/2018 02:29	RS
Toxaphene	BRL	210		mg/Kg-dry	255725	1000	02/14/2018 21:36	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255725	1000	02/14/2018 21:36	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255725	1000	02/14/2018 21:36	RS
PERCENT MOISTURE D2216								
Percent Moisture	20.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E27 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:30:00 PM
Lab ID:	1802987-015	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	253	7.87		mg/Kg-dry	255704	50	02/16/2018 13:25	DP
Copper	120	5.25		mg/Kg-dry	255704	50	02/16/2018 13:25	DP
Lead	78400	10.5		mg/Kg-dry	255704	200	02/20/2018 19:07	DP
Zinc	230	26.2		mg/Kg-dry	255704	50	02/16/2018 13:25	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.049		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
4,4´-DDE	0.40	0.049		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
4,4´-DDT	0.25	0.049		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
alpha-BHC	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
alpha-Chlordane	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
beta-BHC	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
delta-BHC	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
Dieldrin	BRL	0.049		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
gamma-BHC	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
gamma-Chlordane	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
Heptachlor	BRL	0.025		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
Methoxychlor	BRL	0.25		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
Toxaphene	BRL	2.5		mg/Kg-dry	255725	10	02/14/2018 17:52	RS
Surr: Decachlorobiphenyl	65.8	45-128		%REC	255725	10	02/14/2018 17:52	RS
Surr: Tetrachloro-m-xylene	69.1	46-120		%REC	255725	10	02/14/2018 17:52	RS
PERCENT MOISTURE D2216								
Percent Moisture	32.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D27 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:41:00 PM
Lab ID:	1802987-016	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	135	7.81		mg/Kg-dry	255704	50	02/16/2018 13:27	DP
Copper	139	4.59		mg/Kg-dry	255704	50	02/16/2018 13:27	DP
Lead	3740	2.30		mg/Kg-dry	255704	50	02/16/2018 13:27	DP
Zinc	186	23.0		mg/Kg-dry	255704	50	02/16/2018 13:27	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.042		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
4,4´-DDE	0.12	0.042		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
4,4´-DDT	0.059	0.042		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
alpha-BHC	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
alpha-Chlordane	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
beta-BHC	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
delta-BHC	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
Dieldrin	BRL	0.042		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
gamma-BHC	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
gamma-Chlordane	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
Heptachlor	BRL	0.021		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
Methoxychlor	BRL	0.21		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
Toxaphene	BRL	2.1		mg/Kg-dry	255725	10	02/14/2018 18:08	RS
Surr: Decachlorobiphenyl	60.5	45-128		%REC	255725	10	02/14/2018 18:08	RS
Surr: Tetrachloro-m-xylene	53.7	46-120		%REC	255725	10	02/14/2018 18:08	RS
PERCENT MOISTURE D2216								
Percent Moisture	21.0	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E26 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:45:00 PM
Lab ID:	1802987-017	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	119	8.93		mg/Kg-dry	255704	100	02/16/2018 20:15	DP
Copper	39.4	9.92		mg/Kg-dry	255704	100	02/16/2018 20:15	DP
Lead	495	2.48		mg/Kg-dry	255704	50	02/16/2018 13:35	DP
Zinc	93.9	49.6		mg/Kg-dry	255704	100	02/16/2018 20:15	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.057	0.045		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
4,4´-DDE	0.19	0.045		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
4,4´-DDT	0.62	0.045		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
alpha-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
alpha-Chlordane	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
beta-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
delta-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
Dieldrin	BRL	0.045		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
gamma-BHC	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
gamma-Chlordane	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
Heptachlor	BRL	0.022		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
Methoxychlor	BRL	0.22		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
Toxaphene	BRL	2.2		mg/Kg-dry	255725	10	02/14/2018 18:24	RS
Surr: Decachlorobiphenyl	87.5	45-128		%REC	255725	10	02/14/2018 18:24	RS
Surr: Tetrachloro-m-xylene	84.7	46-120		%REC	255725	10	02/14/2018 18:24	RS
PERCENT MOISTURE D2216								
Percent Moisture	25.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C29 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:47:00 PM
Lab ID:	1802987-018	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.35		mg/Kg-dry	255704	50	02/16/2018 20:02	DP
Copper	25.5	4.59		mg/Kg-dry	255704	50	02/16/2018 20:02	DP
Lead	122	2.30		mg/Kg-dry	255704	50	02/16/2018 13:37	DP
Zinc	126	23.0		mg/Kg-dry	255704	50	02/16/2018 20:02	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0043		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
4,4´-DDE	BRL	0.0043		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
4,4´-DDT	0.012	0.0043		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
alpha-BHC	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
alpha-Chlordane	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
beta-BHC	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
delta-BHC	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
Dieldrin	BRL	0.0043		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
gamma-BHC	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
gamma-Chlordane	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
Heptachlor	BRL	0.0022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
Methoxychlor	BRL	0.022		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
Toxaphene	BRL	0.22		mg/Kg-dry	255725	1	02/14/2018 15:44	RS
Surr: Decachlorobiphenyl	92.3	45-128		%REC	255725	1	02/14/2018 15:44	RS
Surr: Tetrachloro-m-xylene	70.7	46-120		%REC	255725	1	02/14/2018 15:44	RS
PERCENT MOISTURE D2216								
Percent Moisture	22.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D28 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 3:55:00 PM
Lab ID:	1802987-019	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	277	7.52		mg/Kg-dry	255704	50	02/16/2018 13:39	DP
Copper	121	5.01		mg/Kg-dry	255704	50	02/16/2018 13:39	DP
Lead	65600	10.0		mg/Kg-dry	255704	200	02/20/2018 19:09	DP
Zinc	189	25.1		mg/Kg-dry	255704	50	02/16/2018 13:39	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.047		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
4,4´-DDE	0.30	0.047		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
4,4´-DDT	0.14	0.047		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
alpha-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
alpha-Chlordane	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
beta-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
delta-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
Dieldrin	BRL	0.047		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
gamma-BHC	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
gamma-Chlordane	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
Heptachlor	BRL	0.024		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
Methoxychlor	BRL	0.24		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
Toxaphene	BRL	2.4		mg/Kg-dry	255725	10	02/14/2018 18:40	RS
Surr: Decachlorobiphenyl	73.4	45-128		%REC	255725	10	02/14/2018 18:40	RS
Surr: Tetrachloro-m-xylene	66.4	46-120		%REC	255725	10	02/14/2018 18:40	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E25 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 4:05:00 PM
Lab ID:	1802987-020	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	386	7.88		mg/Kg-dry	255704	50	02/16/2018 13:41	DP
Copper	332	4.92		mg/Kg-dry	255704	50	02/16/2018 13:41	DP
Lead	13400	4.92		mg/Kg-dry	255704	100	02/19/2018 18:09	DP
Zinc	702	24.6		mg/Kg-dry	255704	50	02/16/2018 13:41	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	22	4.5		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
4,4´-DDE	BRL	4.5		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
4,4´-DDT	1100	45		mg/Kg-dry	255725	10000	02/17/2018 02:45	RS
alpha-BHC	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
alpha-Chlordane	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
beta-BHC	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
delta-BHC	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
Dieldrin	BRL	4.5		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
gamma-BHC	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
gamma-Chlordane	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
Heptachlor	BRL	2.3		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
Methoxychlor	BRL	230		mg/Kg-dry	255725	10000	02/17/2018 02:45	RS
Toxaphene	BRL	230		mg/Kg-dry	255725	1000	02/14/2018 21:52	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255725	1000	02/14/2018 21:52	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255725	1000	02/14/2018 21:52	RS
PERCENT MOISTURE D2216								
Percent Moisture	26.6	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D29 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 4:10:00 PM
Lab ID:	1802987-021	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	11.6		mg/Kg-dry	255705	200	02/20/2018 14:06	DP
Copper	22.1	11.6		mg/Kg-dry	255705	200	02/20/2018 14:06	DP
Lead	51.4	11.6		mg/Kg-dry	255705	200	02/20/2018 14:06	DP
Zinc	144	116		mg/Kg-dry	255705	200	02/20/2018 14:06	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0046		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
4,4´-DDE	BRL	0.0046		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
4,4´-DDT	BRL	0.0046		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
alpha-BHC	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
alpha-Chlordane	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
beta-BHC	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
delta-BHC	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
Dieldrin	BRL	0.0046		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
gamma-BHC	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
gamma-Chlordane	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
Heptachlor	BRL	0.0023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
Methoxychlor	BRL	0.023		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
Toxaphene	BRL	0.23		mg/Kg-dry	255746	1	02/16/2018 13:19	RS
Surr: Decachlorobiphenyl	100	45-128		%REC	255746	1	02/16/2018 13:19	RS
Surr: Tetrachloro-m-xylene	77.1	46-120		%REC	255746	1	02/16/2018 13:19	RS
PERCENT MOISTURE D2216								
Percent Moisture	28.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C28 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 4:16:00 PM
Lab ID:	1802987-022	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	170	16.7		mg/Kg-dry	255705	200	02/20/2018 14:08	DP
Copper	109	18.6		mg/Kg-dry	255705	200	02/20/2018 14:08	DP
Lead	499	9.28		mg/Kg-dry	255705	200	02/20/2018 14:08	DP
Zinc	391	92.8		mg/Kg-dry	255705	200	02/20/2018 14:08	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.022		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
4,4´-DDE	BRL	0.022		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
4,4´-DDT	BRL	0.022		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
alpha-BHC	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
alpha-Chlordane	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
beta-BHC	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
delta-BHC	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
Dieldrin	BRL	0.022		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
gamma-BHC	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
gamma-Chlordane	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
Heptachlor	BRL	0.011		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
Methoxychlor	BRL	0.11		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
Toxaphene	BRL	1.1		mg/Kg-dry	255746	5	02/16/2018 14:09	RS
Surr: Decachlorobiphenyl	91.8	45-128		%REC	255746	5	02/16/2018 14:09	RS
Surr: Tetrachloro-m-xylene	71.4	46-120		%REC	255746	5	02/16/2018 14:09	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C27 (0-1) 020618
Project Name:	BFEL - Atlanta	**Collection Date:**	2/6/2018 4:41:00 PM
Lab ID:	1802987-023	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	449	38.7		mg/Kg-dry	255705	200	02/20/2018 14:10	DP
Copper	750	25.8		mg/Kg-dry	255705	200	02/20/2018 14:10	DP
Lead	2130	12.9		mg/Kg-dry	255705	200	02/20/2018 14:10	DP
Zinc	1490	129		mg/Kg-dry	255705	200	02/20/2018 14:10	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.30		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
4,4´-DDE	0.52	0.30		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
4,4´-DDT	0.38	0.30		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
alpha-BHC	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
alpha-Chlordane	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
beta-BHC	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
delta-BHC	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
Dieldrin	BRL	0.30		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
gamma-BHC	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
gamma-Chlordane	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
Heptachlor	BRL	0.15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
Methoxychlor	BRL	1.5		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
Toxaphene	BRL	15		mg/Kg-dry	255746	50	02/16/2018 14:25	RS
Surr: Decachlorobiphenyl	93.9	45-128		%REC	255746	50	02/16/2018 14:25	RS
Surr: Tetrachloro-m-xylene	75.4	46-120		%REC	255746	50	02/16/2018 14:25	RS
PERCENT MOISTURE D2216								
Percent Moisture	45.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D26 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 10:38:00 AM
Lab ID:	1802987-024	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	1140	33.3		mg/Kg-dry	255705	200	02/20/2018 14:17	DP
Copper	141	22.2		mg/Kg-dry	255705	200	02/20/2018 14:17	DP
Lead	8170	11.1		mg/Kg-dry	255705	200	02/20/2018 14:17	DP
Zinc	210	111		mg/Kg-dry	255705	200	02/20/2018 14:17	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.025		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
4,4´-DDE	0.060	0.025		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
4,4´-DDT	0.050	0.025		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
alpha-BHC	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
alpha-Chlordane	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
beta-BHC	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
delta-BHC	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
Dieldrin	BRL	0.025		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
gamma-BHC	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
gamma-Chlordane	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
Heptachlor	BRL	0.013		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
Methoxychlor	BRL	0.13		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
Toxaphene	BRL	1.3		mg/Kg-dry	255746	5	02/16/2018 14:41	RS
Surr: Decachlorobiphenyl	89.7	45-128		%REC	255746	5	02/16/2018 14:41	RS
Surr: Tetrachloro-m-xylene	75.7	46-120		%REC	255746	5	02/16/2018 14:41	RS
PERCENT MOISTURE D2216								
Percent Moisture	33.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D25 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 10:49:00 AM
Lab ID:	1802987-025	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	9.55		mg/Kg-dry	255705	200	02/20/2018 14:19	DP
Copper	77.1	19.1		mg/Kg-dry	255705	200	02/20/2018 14:19	DP
Lead	131	9.55		mg/Kg-dry	255705	200	02/20/2018 14:19	DP
Zinc	415	95.5		mg/Kg-dry	255705	200	02/20/2018 14:19	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.044		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
4,4´-DDE	BRL	0.044		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
4,4´-DDT	BRL	0.044		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
alpha-BHC	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
alpha-Chlordane	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
beta-BHC	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
delta-BHC	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
Dieldrin	BRL	0.044		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
gamma-BHC	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
gamma-Chlordane	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
Heptachlor	BRL	0.022		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
Methoxychlor	BRL	0.22		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
Toxaphene	BRL	2.2		mg/Kg-dry	255746	10	02/16/2018 14:57	RS
Surr: Decachlorobiphenyl	103	45-128		%REC	255746	10	02/16/2018 14:57	RS
Surr: Tetrachloro-m-xylene	84.3	46-120		%REC	255746	10	02/16/2018 14:57	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C26 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 10:52:00 AM
Lab ID:	1802987-026	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	247	30.5		mg/Kg-dry	255705	200	02/20/2018 14:21	DP
Copper	522	20.3		mg/Kg-dry	255705	200	02/20/2018 14:21	DP
Lead	1530	10.2		mg/Kg-dry	255705	200	02/20/2018 14:21	DP
Zinc	1320	102		mg/Kg-dry	255705	200	02/20/2018 14:21	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.023		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
4,4´-DDE	0.18	0.023		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
4,4´-DDT	0.043	0.023		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
alpha-BHC	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
alpha-Chlordane	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
beta-BHC	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
delta-BHC	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
Dieldrin	BRL	0.023		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
gamma-BHC	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
gamma-Chlordane	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
Heptachlor	BRL	0.012		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
Methoxychlor	BRL	0.12		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
Toxaphene	BRL	1.2		mg/Kg-dry	255746	5	02/16/2018 15:13	RS
Surr: Decachlorobiphenyl	80.8	45-128		%REC	255746	5	02/16/2018 15:13	RS
Surr: Tetrachloro-m-xylene	69.8	46-120		%REC	255746	5	02/16/2018 15:13	RS
PERCENT MOISTURE D2216								
Percent Moisture	28.6	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E24 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:00:00 AM
Lab ID:	1802987-027	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	56.7	33.0		mg/Kg-dry	255705	200	02/20/2018 18:34	DP
Copper	88.5	22.0		mg/Kg-dry	255705	200	02/20/2018 18:34	DP
Lead	911	11.0		mg/Kg-dry	255705	200	02/20/2018 18:34	DP
Zinc	605	110		mg/Kg-dry	255705	200	02/20/2018 18:34	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.73	0.49		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
4,4´-DDE	1.6	0.49		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
4,4´-DDT	3.1	0.49		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
alpha-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
alpha-Chlordane	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
beta-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
delta-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
Dieldrin	BRL	0.49		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
gamma-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
gamma-Chlordane	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
Heptachlor	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
Methoxychlor	BRL	2.4		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
Toxaphene	BRL	24		mg/Kg-dry	255746	100	02/16/2018 15:29	RS
Surr: Decachlorobiphenyl	102	45-128		%REC	255746	100	02/16/2018 15:29	RS
Surr: Tetrachloro-m-xylene	95.8	46-120		%REC	255746	100	02/16/2018 15:29	RS
PERCENT MOISTURE D2216								
Percent Moisture	31.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D24 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:02:00 AM
Lab ID:	1802987-028	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	106	33.6		mg/Kg-dry	255705	200	02/20/2018 18:36	DP
Copper	308	22.4		mg/Kg-dry	255705	200	02/20/2018 18:36	DP
Lead	708	11.2		mg/Kg-dry	255705	200	02/20/2018 18:36	DP
Zinc	358	112		mg/Kg-dry	255705	200	02/20/2018 18:36	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.010		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
4,4´-DDE	BRL	0.010		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
4,4´-DDT	0.012	0.010		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
alpha-BHC	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
alpha-Chlordane	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
beta-BHC	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
delta-BHC	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
Dieldrin	BRL	0.010		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
gamma-BHC	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
gamma-Chlordane	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
Heptachlor	BRL	0.0052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
Methoxychlor	BRL	0.052		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
Toxaphene	BRL	0.52		mg/Kg-dry	255746	2	02/16/2018 15:45	RS
Surr: Decachlorobiphenyl	89.5	45-128		%REC	255746	2	02/16/2018 15:45	RS
Surr: Tetrachloro-m-xylene	75.3	46-120		%REC	255746	2	02/16/2018 15:45	RS
PERCENT MOISTURE D2216								
Percent Moisture	36.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C25 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:06:00 AM
Lab ID:	1802987-029	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	288	29.0		mg/Kg-dry	255705	200	02/20/2018 18:38	DP
Copper	114	19.3		mg/Kg-dry	255705	200	02/20/2018 18:38	DP
Lead	153	9.65		mg/Kg-dry	255705	200	02/20/2018 18:38	DP
Zinc	BRL	96.5		mg/Kg-dry	255705	200	02/20/2018 18:38	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0090		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
4,4´-DDE	BRL	0.0090		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
4,4´-DDT	BRL	0.0090		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
alpha-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
alpha-Chlordane	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
beta-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
delta-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
Dieldrin	BRL	0.0090		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
gamma-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
gamma-Chlordane	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
Heptachlor	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
Methoxychlor	BRL	0.045		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
Toxaphene	BRL	0.45		mg/Kg-dry	255746	2	02/16/2018 16:01	RS
Surr: Decachlorobiphenyl	89.7	45-128		%REC	255746	2	02/16/2018 16:01	RS
Surr: Tetrachloro-m-xylene	74.5	46-120		%REC	255746	2	02/16/2018 16:01	RS
PERCENT MOISTURE D2216								
Percent Moisture	25.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D23 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:18:00 AM
Lab ID:	1802987-030	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	9.97		mg/Kg-dry	255705	200	02/20/2018 18:40	DP
Copper	118	19.9		mg/Kg-dry	255705	200	02/20/2018 18:40	DP
Lead	180	9.97		mg/Kg-dry	255705	200	02/20/2018 18:40	DP
Zinc	901	99.7		mg/Kg-dry	255705	200	02/20/2018 18:40	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
4,4´-DDE	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
4,4´-DDT	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
alpha-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
alpha-Chlordane	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
beta-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
delta-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
Dieldrin	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
gamma-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
gamma-Chlordane	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
Heptachlor	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
Methoxychlor	BRL	0.23		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
Toxaphene	BRL	2.3		mg/Kg-dry	255746	10	02/16/2018 16:17	RS
Surr: Decachlorobiphenyl	95.7	45-128		%REC	255746	10	02/16/2018 16:17	RS
Surr: Tetrachloro-m-xylene	82.4	46-120		%REC	255746	10	02/16/2018 16:17	RS
PERCENT MOISTURE D2216								
Percent Moisture	27.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E23 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:20:00 AM
Lab ID:	1802987-031	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	16.9	10.4		mg/Kg-dry	255705	200	02/20/2018 18:42	DP
Copper	60.2	20.7		mg/Kg-dry	255705	200	02/20/2018 18:42	DP
Lead	1020	10.4		mg/Kg-dry	255705	200	02/20/2018 18:42	DP
Zinc	1000	104		mg/Kg-dry	255705	200	02/20/2018 18:42	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.48		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
4,4´-DDE	BRL	0.48		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
4,4´-DDT	0.51	0.48		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
alpha-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
alpha-Chlordane	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
beta-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
delta-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
Dieldrin	BRL	0.48		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
gamma-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
gamma-Chlordane	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
Heptachlor	BRL	0.24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
Methoxychlor	BRL	2.4		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
Toxaphene	BRL	24		mg/Kg-dry	255746	100	02/16/2018 16:33	RS
Surr: Decachlorobiphenyl	101	45-128		%REC	255746	100	02/16/2018 16:33	RS
Surr: Tetrachloro-m-xylene	104	46-120		%REC	255746	100	02/16/2018 16:33	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C24 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:25:00 AM
Lab ID:	1802987-032	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	11.1		mg/Kg-dry	255705	200	02/20/2018 13:56	DP
Copper	44.1	22.1		mg/Kg-dry	255705	200	02/20/2018 13:56	DP
Lead	22.6	11.1		mg/Kg-dry	255705	200	02/20/2018 13:56	DP
Zinc	BRL	111		mg/Kg-dry	255705	200	02/20/2018 13:56	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0048		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
4,4´-DDE	BRL	0.0048		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
4,4´-DDT	0.075	0.0048		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
alpha-BHC	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
alpha-Chlordane	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
beta-BHC	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
delta-BHC	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
Dieldrin	BRL	0.0048		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
gamma-BHC	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
gamma-Chlordane	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
Heptachlor	BRL	0.0024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
Methoxychlor	BRL	0.024		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
Toxaphene	BRL	0.24		mg/Kg-dry	255746	1	02/16/2018 16:49	RS
Surr: Decachlorobiphenyl	83.9	45-128		%REC	255746	1	02/16/2018 16:49	RS
Surr: Tetrachloro-m-xylene	71.5	46-120		%REC	255746	1	02/16/2018 16:49	RS
PERCENT MOISTURE D2216								
Percent Moisture	30.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D22 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:34:00 AM
Lab ID:	1802987-033	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	188	28.7		mg/Kg-dry	255705	200	02/20/2018 18:43	DP
Copper	606	19.1		mg/Kg-dry	255705	200	02/20/2018 18:43	DP
Lead	2550	9.55		mg/Kg-dry	255705	200	02/20/2018 18:43	DP
Zinc	919	95.5		mg/Kg-dry	255705	200	02/20/2018 18:43	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.88	0.087		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
4,4´-DDE	1.0	0.087		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
4,4´-DDT	19	0.87		mg/Kg-dry	255746	200	02/19/2018 11:19	RS
alpha-BHC	0.14	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
alpha-Chlordane	0.18	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
beta-BHC	0.59	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
delta-BHC	0.061	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
Dieldrin	0.90	0.087		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
gamma-BHC	0.064	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
gamma-Chlordane	0.84	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
Heptachlor	0.40	0.044		mg/Kg-dry	255746	20	02/15/2018 03:12	RS
Methoxychlor	BRL	4.4		mg/Kg-dry	255746	200	02/19/2018 11:19	RS
Toxaphene	BRL	44		mg/Kg-dry	255746	200	02/19/2018 11:19	RS
Surr: Decachlorobiphenyl	126	45-128		%REC	255746	20	02/15/2018 03:12	RS
Surr: Tetrachloro-m-xylene	86.5	46-120		%REC	255746	20	02/15/2018 03:12	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C23 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 11:44:00 AM
Lab ID:	1802987-034	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	327	29.7		mg/Kg-dry	255705	200	02/20/2018 18:45	DP
Copper	254	19.8		mg/Kg-dry	255705	200	02/20/2018 18:45	DP
Lead	1210	9.91		mg/Kg-dry	255705	200	02/20/2018 18:45	DP
Zinc	201	99.1		mg/Kg-dry	255705	200	02/20/2018 18:45	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
4,4´-DDE	0.058	0.046		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
4,4´-DDT	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
alpha-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
alpha-Chlordane	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
beta-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
delta-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
Dieldrin	BRL	0.046		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
gamma-BHC	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
gamma-Chlordane	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
Heptachlor	BRL	0.023		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
Methoxychlor	BRL	0.23		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
Toxaphene	BRL	2.3		mg/Kg-dry	255746	10	02/16/2018 19:33	RS
Surr: Decachlorobiphenyl	88.9	45-128		%REC	255746	10	02/16/2018 19:33	RS
Surr: Tetrachloro-m-xylene	73	46-120		%REC	255746	10	02/16/2018 19:33	RS
PERCENT MOISTURE D2216								
Percent Moisture	28.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B22 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 12:25:00 PM
Lab ID:	1802987-035	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	74.8	30.6		mg/Kg-dry	255705	200	02/20/2018 18:47	DP
Copper	161	20.4		mg/Kg-dry	255705	200	02/20/2018 18:47	DP
Lead	486	10.2		mg/Kg-dry	255705	200	02/20/2018 18:47	DP
Zinc	309	102		mg/Kg-dry	255705	200	02/20/2018 18:47	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0090		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
4,4´-DDE	0.078	0.0090		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
4,4´-DDT	0.091	0.0090		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
alpha-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
alpha-Chlordane	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
beta-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
delta-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
Dieldrin	BRL	0.0090		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
gamma-BHC	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
gamma-Chlordane	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
Heptachlor	BRL	0.0045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
Methoxychlor	BRL	0.045		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
Toxaphene	BRL	0.45		mg/Kg-dry	255746	2	02/16/2018 19:49	RS
Surr: Decachlorobiphenyl	76.4	45-128		%REC	255746	2	02/16/2018 19:49	RS
Surr: Tetrachloro-m-xylene	67.3	46-120		%REC	255746	2	02/16/2018 19:49	RS
PERCENT MOISTURE D2216								
Percent Moisture	25.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B23 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 12:50:00 PM
Lab ID:	1802987-036	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	23.5	21.4		mg/Kg-dry	255705	200	02/20/2018 18:55	DP
Copper	99.1	21.4		mg/Kg-dry	255705	200	02/20/2018 18:55	DP
Lead	300	10.7		mg/Kg-dry	255705	200	02/20/2018 18:55	DP
Zinc	460	107		mg/Kg-dry	255705	200	02/20/2018 18:55	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	1.1	0.10		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
4,4´-DDE	1.2	0.10		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
4,4´-DDT	16	1.0		mg/Kg-dry	255746	200	02/17/2018 03:17	RS
alpha-BHC	0.061	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
alpha-Chlordane	0.22	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
beta-BHC	0.055	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
delta-BHC	BRL	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
Dieldrin	0.35	0.10		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
gamma-BHC	BRL	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
gamma-Chlordane	0.46	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
Heptachlor	BRL	0.051		mg/Kg-dry	255746	20	02/15/2018 03:28	RS
Methoxychlor	BRL	5.1		mg/Kg-dry	255746	200	02/17/2018 03:17	RS
Toxaphene	BRL	51		mg/Kg-dry	255746	200	02/17/2018 03:17	RS
Surr: Decachlorobiphenyl	86.2	45-128		%REC	255746	20	02/15/2018 03:28	RS
Surr: Tetrachloro-m-xylene	83.2	46-120		%REC	255746	20	02/15/2018 03:28	RS
PERCENT MOISTURE D2216								
Percent Moisture	34.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B24 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 1:10:00 PM
Lab ID:	1802987-037	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	11.3	10.1		mg/Kg-dry	255705	200	02/20/2018 18:57	DP
Copper	66.0	20.1		mg/Kg-dry	255705	200	02/20/2018 18:57	DP
Lead	126	10.1		mg/Kg-dry	255705	200	02/20/2018 18:57	DP
Zinc	146	101		mg/Kg-dry	255705	200	02/20/2018 18:57	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.078	0.0094		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
4,4´-DDE	0.99	0.24		mg/Kg-dry	255746	50	02/16/2018 23:01	RS
4,4´-DDT	1.0	0.24		mg/Kg-dry	255746	50	02/16/2018 23:01	RS
alpha-BHC	BRL	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
alpha-Chlordane	0.0087	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
beta-BHC	BRL	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
delta-BHC	BRL	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
Dieldrin	0.016	0.0094		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
gamma-BHC	BRL	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
gamma-Chlordane	BRL	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
Heptachlor	BRL	0.0047		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
Methoxychlor	BRL	1.2		mg/Kg-dry	255746	50	02/16/2018 23:01	RS
Toxaphene	0.49	0.47		mg/Kg-dry	255746	2	02/15/2018 00:00	RS
Surr: Decachlorobiphenyl	73.6	45-128		%REC	255746	2	02/15/2018 00:00	RS
Surr: Tetrachloro-m-xylene	54.5	46-120		%REC	255746	2	02/15/2018 00:00	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D21 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 1:34:00 PM
Lab ID:	1802987-038	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	90.5	27.4		mg/Kg-dry	255705	200	02/20/2018 18:59	DP
Copper	143	18.2		mg/Kg-dry	255705	200	02/20/2018 18:59	DP
Lead	503	9.12		mg/Kg-dry	255705	200	02/20/2018 18:59	DP
Zinc	521	91.2		mg/Kg-dry	255705	200	02/20/2018 18:59	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.69	0.21		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
4,4´-DDE	1.0	0.21		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
4,4´-DDT	9.5	2.1		mg/Kg-dry	255746	500	02/19/2018 11:50	RS
alpha-BHC	0.12	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
alpha-Chlordane	0.51	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
beta-BHC	0.93	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
delta-BHC	BRL	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
Dieldrin	1.3	0.21		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
gamma-BHC	BRL	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
gamma-Chlordane	0.91	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
Heptachlor	0.13	0.11		mg/Kg-dry	255746	50	02/15/2018 04:00	RS
Methoxychlor	BRL	11		mg/Kg-dry	255746	500	02/19/2018 11:50	RS
Toxaphene	BRL	110		mg/Kg-dry	255746	500	02/19/2018 11:50	RS
Surr: Decachlorobiphenyl	159	45-128	S	%REC	255746	50	02/15/2018 04:00	RS
Surr: Tetrachloro-m-xylene	77.6	46-120		%REC	255746	50	02/15/2018 04:00	RS
PERCENT MOISTURE D2216								
Percent Moisture	20.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B25 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 1:35:00 PM
Lab ID:	1802987-039	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	62.0	39.8		mg/Kg-dry	255705	200	02/20/2018 19:01	DP
Copper	117	26.5		mg/Kg-dry	255705	200	02/20/2018 19:01	DP
Lead	257	13.3		mg/Kg-dry	255705	200	02/20/2018 19:01	DP
Zinc	506	133		mg/Kg-dry	255705	200	02/20/2018 19:01	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.029		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
4,4´-DDE	0.42	0.029		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
4,4´-DDT	0.38	0.029		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
alpha-BHC	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
alpha-Chlordane	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
beta-BHC	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
delta-BHC	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
Dieldrin	BRL	0.029		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
gamma-BHC	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
gamma-Chlordane	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
Heptachlor	BRL	0.015		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
Methoxychlor	BRL	0.15		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
Toxaphene	BRL	1.5		mg/Kg-dry	255746	5	02/16/2018 20:05	RS
Surr: Decachlorobiphenyl	72	45-128		%REC	255746	5	02/16/2018 20:05	RS
Surr: Tetrachloro-m-xylene	64.2	46-120		%REC	255746	5	02/16/2018 20:05	RS
PERCENT MOISTURE D2216								
Percent Moisture	42.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D20 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 1:46:00 PM
Lab ID:	1802987-040	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	176	30.9		mg/Kg-dry	255705	200	02/20/2018 19:03	DP
Copper	488	20.6		mg/Kg-dry	255705	200	02/20/2018 19:03	DP
Lead	1350	10.3		mg/Kg-dry	255705	200	02/20/2018 19:03	DP
Zinc	960	103		mg/Kg-dry	255705	200	02/20/2018 19:03	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.79	0.47		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
4,4´-DDE	1.3	0.47		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
4,4´-DDT	19	4.7		mg/Kg-dry	255746	1000	02/17/2018 01:57	RS
alpha-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
alpha-Chlordane	1.3	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
beta-BHC	0.29	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
delta-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
Dieldrin	1.1	0.47		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
gamma-BHC	BRL	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
gamma-Chlordane	1.6	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
Heptachlor	BRL	0.24		mg/Kg-dry	255746	100	02/15/2018 04:32	RS
Methoxychlor	BRL	24		mg/Kg-dry	255746	1000	02/17/2018 01:57	RS
Toxaphene	BRL	240		mg/Kg-dry	255746	1000	02/17/2018 01:57	RS
Surr: Decachlorobiphenyl	160	45-128	S	%REC	255746	100	02/15/2018 04:32	RS
Surr: Tetrachloro-m-xylene	82.6	46-120		%REC	255746	100	02/15/2018 04:32	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C22 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 1:57:00 PM
Lab ID:	1802987-041	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	102	31.8		mg/Kg-dry	255713	50	02/16/2018 20:28	DP
Copper	351	4.24		mg/Kg-dry	255713	50	02/16/2018 20:28	DP
Lead	1320	2.12		mg/Kg-dry	255713	50	02/16/2018 20:28	DP
Zinc	559	21.2		mg/Kg-dry	255713	50	02/16/2018 20:28	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.095	0.091		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
4,4´-DDE	0.33	0.091		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
4,4´-DDT	2.6	0.091		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
alpha-BHC	BRL	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
alpha-Chlordane	BRL	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
beta-BHC	0.063	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
delta-BHC	BRL	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
Dieldrin	0.26	0.091		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
gamma-BHC	BRL	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
gamma-Chlordane	0.094	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
Heptachlor	BRL	0.046		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
Methoxychlor	BRL	0.46		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
Toxaphene	BRL	4.6		mg/Kg-dry	255791	20	02/15/2018 20:14	RS
Surr: Decachlorobiphenyl	113	45-128		%REC	255791	20	02/15/2018 20:14	RS
Surr: Tetrachloro-m-xylene	87.1	46-120		%REC	255791	20	02/15/2018 20:14	RS
PERCENT MOISTURE D2216								
Percent Moisture	27.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D19 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:02:00 PM
Lab ID:	1802987-042	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	41.9	9.00		mg/Kg-dry	255713	50	02/16/2018 20:47	DP
Copper	118	4.50		mg/Kg-dry	255713	50	02/16/2018 20:47	DP
Lead	59.7	2.25		mg/Kg-dry	255713	50	02/16/2018 20:47	DP
Zinc	220	22.5		mg/Kg-dry	255713	50	02/16/2018 20:47	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	4.4		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
4,4´-DDE	BRL	4.4		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
4,4´-DDT	14	4.4		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
alpha-BHC	BRL	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
alpha-Chlordane	3.9	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
beta-BHC	BRL	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
delta-BHC	BRL	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
Dieldrin	BRL	4.4		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
gamma-BHC	BRL	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
gamma-Chlordane	4.2	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
Heptachlor	BRL	2.2		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
Methoxychlor	BRL	22		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
Toxaphene	BRL	220		mg/Kg-dry	255791	1000	02/16/2018 22:45	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255791	1000	02/16/2018 22:45	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255791	1000	02/16/2018 22:45	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B26 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:05:00 PM
Lab ID:	1802987-043	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.40		mg/Kg-dry	255713	50	02/16/2018 20:52	DP
Copper	48.1	5.74		mg/Kg-dry	255713	50	02/16/2018 20:52	DP
Lead	71.1	2.87		mg/Kg-dry	255713	50	02/16/2018 20:52	DP
Zinc	101	28.7		mg/Kg-dry	255713	50	02/16/2018 20:52	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0087		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
4,4´-DDE	0.011	0.0087		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
4,4´-DDT	BRL	0.0087		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
alpha-BHC	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
alpha-Chlordane	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
beta-BHC	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
delta-BHC	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
Dieldrin	BRL	0.0087		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
gamma-BHC	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
gamma-Chlordane	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
Heptachlor	BRL	0.0043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
Methoxychlor	BRL	0.043		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
Toxaphene	BRL	0.43		mg/Kg-dry	255791	2	02/15/2018 14:36	RS
Surr: Decachlorobiphenyl	77.4	45-128		%REC	255791	2	02/15/2018 14:36	RS
Surr: Tetrachloro-m-xylene	61.8	46-120		%REC	255791	2	02/15/2018 14:36	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C21 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:10:00 PM
Lab ID:	1802987-044	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	36.5	10.8		mg/Kg-dry	255713	50	02/16/2018 20:57	DP
Copper	151	5.41		mg/Kg-dry	255713	50	02/16/2018 20:57	DP
Lead	1340	2.70		mg/Kg-dry	255713	50	02/16/2018 20:57	DP
Zinc	166	27.0		mg/Kg-dry	255713	50	02/16/2018 20:57	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0043		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
4,4´-DDE	0.055	0.0043		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
4,4´-DDT	0.15	0.043		mg/Kg-dry	255791	10	02/16/2018 21:09	RS
alpha-BHC	BRL	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
alpha-Chlordane	0.0055	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
beta-BHC	0.021	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
delta-BHC	BRL	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
Dieldrin	0.055	0.0043		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
gamma-BHC	BRL	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
gamma-Chlordane	0.019	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
Heptachlor	BRL	0.0022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
Methoxychlor	BRL	0.022		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
Toxaphene	0.25	0.22		mg/Kg-dry	255791	1	02/15/2018 14:52	RS
Surr: Decachlorobiphenyl	66.9	45-128		%REC	255791	1	02/15/2018 14:52	RS
Surr: Tetrachloro-m-xylene	50.8	46-120		%REC	255791	1	02/15/2018 14:52	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C20 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:25:00 PM
Lab ID:	1802987-045	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	105	13.3		mg/Kg-dry	255713	50	02/16/2018 21:02	DP
Copper	460	6.64		mg/Kg-dry	255713	50	02/16/2018 21:02	DP
Lead	1330	3.32		mg/Kg-dry	255713	50	02/16/2018 21:02	DP
Zinc	784	33.2		mg/Kg-dry	255713	50	02/16/2018 21:02	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	27	9.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
4,4´-DDE	25	9.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
4,4´-DDT	1600	99		mg/Kg-dry	255791	20000	02/19/2018 12:06	RS
alpha-BHC	BRL	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
alpha-Chlordane	23	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
beta-BHC	56	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
delta-BHC	BRL	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
Dieldrin	29	9.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
gamma-BHC	BRL	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
gamma-Chlordane	69	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
Heptachlor	41	4.9		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
Methoxychlor	BRL	49		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
Toxaphene	BRL	490		mg/Kg-dry	255791	2000	02/16/2018 22:29	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255791	2000	02/16/2018 22:29	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255791	2000	02/16/2018 22:29	RS
PERCENT MOISTURE D2216								
Percent Moisture	32.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D18 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:28:00 PM
Lab ID:	1802987-046	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	312	9.50		mg/Kg-dry	255713	50	02/16/2018 19:58	DP
Copper	526	4.75		mg/Kg-dry	255713	50	02/16/2018 19:58	DP
Lead	3600	2.38		mg/Kg-dry	255713	50	02/16/2018 19:58	DP
Zinc	599	23.8		mg/Kg-dry	255713	50	02/16/2018 19:58	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.43		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
4,4´-DDE	2.3	0.43		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
4,4´-DDT	BRL	43		mg/Kg-dry	255791	10000	02/16/2018 21:25	RS
alpha-BHC	0.61	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
alpha-Chlordane	3.2	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
beta-BHC	4.5	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
delta-BHC	BRL	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
Dieldrin	8.9	0.43		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
gamma-BHC	0.44	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
gamma-Chlordane	4.4	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
Heptachlor	2.8	0.21		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
Methoxychlor	BRL	2.1		mg/Kg-dry	255791	100	02/16/2018 00:30	RS
Toxaphene	BRL	2100		mg/Kg-dry	255791	10000	02/16/2018 21:25	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255791	100	02/16/2018 00:30	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255791	100	02/16/2018 00:30	RS
PERCENT MOISTURE D2216								
Percent Moisture	22.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B27 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:35:00 PM
Lab ID:	1802987-047	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	8.03	7.46		mg/Kg-dry	255713	50	02/16/2018 21:07	DP
Copper	44.5	9.69		mg/Kg-dry	255713	50	02/16/2018 21:07	DP
Lead	1030	4.84		mg/Kg-dry	255713	50	02/16/2018 21:07	DP
Zinc	173	48.4		mg/Kg-dry	255713	50	02/16/2018 21:07	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.042		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
4,4´-DDE	BRL	0.042		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
4,4´-DDT	BRL	0.042		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
alpha-BHC	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
alpha-Chlordane	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
beta-BHC	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
delta-BHC	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
Dieldrin	BRL	0.042		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
gamma-BHC	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
gamma-Chlordane	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
Heptachlor	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
Methoxychlor	BRL	0.21		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
Toxaphene	BRL	2.1		mg/Kg-dry	255791	5	02/15/2018 15:08	RS
Surr: Decachlorobiphenyl	66.9	45-128		%REC	255791	5	02/15/2018 15:08	RS
Surr: Tetrachloro-m-xylene	55.7	46-120		%REC	255791	5	02/15/2018 15:08	RS
PERCENT MOISTURE D2216								
Percent Moisture	60.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C19 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:46:00 PM
Lab ID:	1802987-048	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.40		mg/Kg-dry	255713	50	02/16/2018 21:12	DP
Copper	23.7	4.94		mg/Kg-dry	255713	50	02/16/2018 21:12	DP
Lead	33.8	2.47		mg/Kg-dry	255713	50	02/16/2018 21:12	DP
Zinc	44.4	24.7		mg/Kg-dry	255713	50	02/16/2018 21:12	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0041		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
4,4´-DDE	0.036	0.0041		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
4,4´-DDT	0.12	0.0041		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
alpha-BHC	BRL	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
alpha-Chlordane	0.042	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
beta-BHC	0.0037	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
delta-BHC	BRL	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
Dieldrin	BRL	0.41		mg/Kg-dry	255791	100	02/19/2018 11:03	RS
gamma-BHC	BRL	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
gamma-Chlordane	0.063	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
Heptachlor	BRL	0.0020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
Methoxychlor	BRL	0.020		mg/Kg-dry	255791	1	02/15/2018 15:24	RS
Toxaphene	BRL	20		mg/Kg-dry	255791	100	02/19/2018 11:03	RS
Surr: Decachlorobiphenyl	78.6	45-128		%REC	255791	1	02/15/2018 15:24	RS
Surr: Tetrachloro-m-xylene	54.4	46-120		%REC	255791	1	02/15/2018 15:24	RS
PERCENT MOISTURE D2216								
Percent Moisture	17.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D16 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 2:50:00 PM
Lab ID:	1802987-049	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	61.0	11.4		mg/Kg-dry	255713	50	02/16/2018 21:17	DP
Copper	239	5.70		mg/Kg-dry	255713	50	02/16/2018 21:17	DP
Lead	793	2.85		mg/Kg-dry	255713	50	02/16/2018 21:17	DP
Zinc	767	28.5		mg/Kg-dry	255713	50	02/16/2018 21:17	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.45		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
4,4´-DDE	BRL	0.45		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
4,4´-DDT	1.4	0.45		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
alpha-BHC	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
alpha-Chlordane	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
beta-BHC	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
delta-BHC	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
Dieldrin	BRL	0.45		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
gamma-BHC	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
gamma-Chlordane	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
Heptachlor	BRL	0.23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
Methoxychlor	BRL	2.3		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
Toxaphene	BRL	23		mg/Kg-dry	255791	100	02/16/2018 20:21	RS
Surr: Decachlorobiphenyl	83	45-128		%REC	255791	100	02/16/2018 20:21	RS
Surr: Tetrachloro-m-xylene	100	46-120		%REC	255791	100	02/16/2018 20:21	RS
PERCENT MOISTURE D2216								
Percent Moisture	26.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C18 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:03:00 PM
Lab ID:	1802987-050	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.47		mg/Kg-dry	255713	50	02/16/2018 21:22	DP
Copper	6.98	3.79		mg/Kg-dry	255713	50	02/16/2018 21:22	DP
Lead	14.9	1.90		mg/Kg-dry	255713	50	02/16/2018 21:22	DP
Zinc	32.7	19.0		mg/Kg-dry	255713	50	02/16/2018 21:22	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.0073		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
4,4´-DDE	0.11	0.0073		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
4,4´-DDT	0.13	0.0073		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
alpha-BHC	BRL	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
alpha-Chlordane	0.012	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
beta-BHC	BRL	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
delta-BHC	BRL	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
Dieldrin	0.018	0.0073		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
gamma-BHC	BRL	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
gamma-Chlordane	0.016	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
Heptachlor	BRL	0.0036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
Methoxychlor	BRL	0.036		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
Toxaphene	0.74	0.36		mg/Kg-dry	255791	2	02/15/2018 15:40	RS
Surr: Decachlorobiphenyl	83	45-128		%REC	255791	2	02/15/2018 15:40	RS
Surr: Tetrachloro-m-xylene	58	46-120		%REC	255791	2	02/15/2018 15:40	RS
PERCENT MOISTURE D2216								
Percent Moisture	8.14	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D15 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:04:00 PM
Lab ID:	1802987-051	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	35.5	7.98		mg/Kg-dry	255713	50	02/16/2018 21:27	DP
Copper	94.3	3.99		mg/Kg-dry	255713	50	02/16/2018 21:27	DP
Lead	328	1.99		mg/Kg-dry	255713	50	02/16/2018 21:27	DP
Zinc	269	19.9		mg/Kg-dry	255713	50	02/16/2018 21:27	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.088		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
4,4´-DDE	0.28	0.088		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
4,4´-DDT	1.1	0.088		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
alpha-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
alpha-Chlordane	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
beta-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
delta-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
Dieldrin	BRL	0.088		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
gamma-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
gamma-Chlordane	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
Heptachlor	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
Methoxychlor	BRL	0.44		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
Toxaphene	BRL	4.4		mg/Kg-dry	255791	20	02/15/2018 20:30	RS
Surr: Decachlorobiphenyl	96.5	45-128		%REC	255791	20	02/15/2018 20:30	RS
Surr: Tetrachloro-m-xylene	81.9	46-120		%REC	255791	20	02/15/2018 20:30	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B28 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:05:00 PM
Lab ID:	1802987-052	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	65.9	12.7		mg/Kg-dry	255713	50	02/16/2018 21:31	DP
Copper	129	6.36		mg/Kg-dry	255713	50	02/16/2018 21:31	DP
Lead	273	3.18		mg/Kg-dry	255713	50	02/16/2018 21:31	DP
Zinc	677	31.8		mg/Kg-dry	255713	50	02/16/2018 21:31	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.027		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
4,4´-DDE	0.036	0.027		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
4,4´-DDT	0.029	0.027		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
alpha-BHC	BRL	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
alpha-Chlordane	BRL	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
beta-BHC	0.016	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
delta-BHC	BRL	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
Dieldrin	BRL	0.027		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
gamma-BHC	BRL	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
gamma-Chlordane	BRL	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
Heptachlor	BRL	0.014		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
Methoxychlor	BRL	0.14		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
Toxaphene	BRL	1.4		mg/Kg-dry	255791	5	02/15/2018 15:56	RS
Surr: Decachlorobiphenyl	64.2	45-128		%REC	255791	5	02/15/2018 15:56	RS
Surr: Tetrachloro-m-xylene	53.2	46-120		%REC	255791	5	02/15/2018 15:56	RS
PERCENT MOISTURE D2216								
Percent Moisture	38.7	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C17 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:21:00 PM
Lab ID:	1802987-053	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	34.6	12.3		mg/Kg-dry	255713	50	02/16/2018 21:51	DP
Copper	85.4	6.17		mg/Kg-dry	255713	50	02/16/2018 21:51	DP
Lead	217	3.09		mg/Kg-dry	255713	50	02/16/2018 21:51	DP
Zinc	215	30.9		mg/Kg-dry	255713	50	02/16/2018 21:51	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.44		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
4,4´-DDE	0.79	0.44		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
4,4´-DDT	4.9	0.44		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
alpha-BHC	BRL	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
alpha-Chlordane	BRL	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
beta-BHC	0.84	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
delta-BHC	BRL	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
Dieldrin	BRL	0.44		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
gamma-BHC	BRL	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
gamma-Chlordane	BRL	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
Heptachlor	BRL	0.22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
Methoxychlor	BRL	2.2		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
Toxaphene	BRL	22		mg/Kg-dry	255791	100	02/16/2018 20:37	RS
Surr: Decachlorobiphenyl	121	45-128		%REC	255791	100	02/16/2018 20:37	RS
Surr: Tetrachloro-m-xylene	111	46-120		%REC	255791	100	02/16/2018 20:37	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B29 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:35:00 PM
Lab ID:	1802987-054	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	12.5	8.15		mg/Kg-dry	255713	50	02/16/2018 21:56	DP
Copper	55.8	4.08		mg/Kg-dry	255713	50	02/16/2018 21:56	DP
Lead	92.8	2.04		mg/Kg-dry	255713	50	02/16/2018 21:56	DP
Zinc	315	20.4		mg/Kg-dry	255713	50	02/16/2018 21:56	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
4,4´-DDE	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
4,4´-DDT	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
alpha-BHC	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
alpha-Chlordane	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
beta-BHC	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
delta-BHC	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
Dieldrin	BRL	0.021		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
gamma-BHC	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
gamma-Chlordane	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
Heptachlor	BRL	0.011		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
Methoxychlor	BRL	0.11		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
Toxaphene	BRL	1.1		mg/Kg-dry	255791	5	02/15/2018 16:12	RS
Surr: Decachlorobiphenyl	83.8	45-128		%REC	255791	5	02/15/2018 16:12	RS
Surr: Tetrachloro-m-xylene	71.9	46-120		%REC	255791	5	02/15/2018 16:12	RS
PERCENT MOISTURE D2216								
Percent Moisture	21.6	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C16 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:40:00 PM
Lab ID:	1802987-055	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.39		mg/Kg-dry	255713	50	02/16/2018 22:01	DP
Copper	32.6	3.70		mg/Kg-dry	255713	50	02/16/2018 22:01	DP
Lead	56.4	1.85		mg/Kg-dry	255713	50	02/16/2018 22:01	DP
Zinc	67.1	18.5		mg/Kg-dry	255713	50	02/16/2018 22:01	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.088		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
4,4´-DDE	BRL	0.088		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
4,4´-DDT	0.18	0.088		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
alpha-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
alpha-Chlordane	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
beta-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
delta-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
Dieldrin	BRL	0.088		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
gamma-BHC	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
gamma-Chlordane	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
Heptachlor	BRL	0.044		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
Methoxychlor	BRL	0.44		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
Toxaphene	BRL	4.4		mg/Kg-dry	255791	20	02/15/2018 20:46	RS
Surr: Decachlorobiphenyl	87.1	45-128		%REC	255791	20	02/15/2018 20:46	RS
Surr: Tetrachloro-m-xylene	80.9	46-120		%REC	255791	20	02/15/2018 20:46	RS
PERCENT MOISTURE D2216								
Percent Moisture	24.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C15 (0-1) 020818
Project Name:	BFEL - Atlanta	**Collection Date:**	2/8/2018 3:56:00 PM
Lab ID:	1802987-056	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.46		mg/Kg-dry	255713	50	02/20/2018 19:05	DP
Copper	25.1	11.3		mg/Kg-dry	255713	100	02/21/2018 11:36	DP
Lead	35.4	2.82		mg/Kg-dry	255713	50	02/20/2018 19:05	DP
Zinc	65.6	28.2		mg/Kg-dry	255713	50	02/20/2018 19:05	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.024		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
4,4´-DDE	BRL	0.024		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
4,4´-DDT	0.30	0.024		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
alpha-BHC	BRL	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
alpha-Chlordane	BRL	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
beta-BHC	0.021	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
delta-BHC	BRL	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
Dieldrin	BRL	0.024		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
gamma-BHC	BRL	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
gamma-Chlordane	0.021	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
Heptachlor	0.012	0.012		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
Methoxychlor	BRL	0.12		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
Toxaphene	BRL	1.2		mg/Kg-dry	255791	5	02/15/2018 16:28	RS
Surr: Decachlorobiphenyl	77.1	45-128		%REC	255791	5	02/15/2018 16:28	RS
Surr: Tetrachloro-m-xylene	61	46-120		%REC	255791	5	02/15/2018 16:28	RS
PERCENT MOISTURE D2216								
Percent Moisture	29.6	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	A22 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 8:50:00 AM
Lab ID:	1802987-057	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	45.5	13.9		mg/Kg-dry	255713	50	02/16/2018 22:11	DP
Copper	120	6.97		mg/Kg-dry	255713	50	02/16/2018 22:11	DP
Lead	412	3.49		mg/Kg-dry	255713	50	02/16/2018 22:11	DP
Zinc	446	34.9		mg/Kg-dry	255713	50	02/16/2018 22:11	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.52	0.26		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
4,4´-DDE	3.0	0.26		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
4,4´-DDT	19	2.6		mg/Kg-dry	255791	500	02/17/2018 02:13	RS
alpha-BHC	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
alpha-Chlordane	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
beta-BHC	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
delta-BHC	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
Dieldrin	0.26	0.26		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
gamma-BHC	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
gamma-Chlordane	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
Heptachlor	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
Methoxychlor	BRL	1.3		mg/Kg-dry	255791	50	02/15/2018 22:22	RS
Toxaphene	BRL	130		mg/Kg-dry	255791	500	02/17/2018 02:13	RS
Surr: Decachlorobiphenyl	66.6	45-128		%REC	255791	50	02/15/2018 22:22	RS
Surr: Tetrachloro-m-xylene	73.4	46-120		%REC	255791	50	02/15/2018 22:22	RS
PERCENT MOISTURE D2216								
Percent Moisture	35.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D17 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 9:00:00 AM
Lab ID:	1802987-058	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	84.6	6.78		mg/Kg-dry	255713	50	02/16/2018 22:16	DP
Copper	86.7	3.39		mg/Kg-dry	255713	50	02/16/2018 22:16	DP
Lead	665	1.69		mg/Kg-dry	255713	50	02/16/2018 22:16	DP
Zinc	153	16.9		mg/Kg-dry	255713	50	02/16/2018 22:16	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	7.6		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
4,4´-DDE	BRL	7.6		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
4,4´-DDT	130	7.6		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
alpha-BHC	BRL	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
alpha-Chlordane	11	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
beta-BHC	31	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
delta-BHC	BRL	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
Dieldrin	24	7.6		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
gamma-BHC	BRL	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
gamma-Chlordane	17	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
Heptachlor	21	3.8		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
Methoxychlor	BRL	38		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
Toxaphene	BRL	380		mg/Kg-dry	255791	2000	02/16/2018 23:17	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255791	2000	02/16/2018 23:17	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255791	2000	02/16/2018 23:17	RS
PERCENT MOISTURE D2216								
Percent Moisture	11.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	A23 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 9:15:00 AM
Lab ID:	1802987-059	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	14.0	10.5		mg/Kg-dry	255713	50	02/16/2018 22:21	DP
Copper	93.0	7.03		mg/Kg-dry	255713	50	02/16/2018 22:21	DP
Lead	98.5	3.52		mg/Kg-dry	255713	50	02/16/2018 22:21	DP
Zinc	134	35.2		mg/Kg-dry	255713	50	02/16/2018 22:21	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.049		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
4,4´-DDE	0.070	0.049		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
4,4´-DDT	0.12	0.049		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
alpha-BHC	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
alpha-Chlordane	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
beta-BHC	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
delta-BHC	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
Dieldrin	BRL	0.049		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
gamma-BHC	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
gamma-Chlordane	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
Heptachlor	BRL	0.025		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
Methoxychlor	BRL	0.25		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
Toxaphene	BRL	2.5		mg/Kg-dry	255791	10	02/15/2018 16:44	RS
Surr: Decachlorobiphenyl	64.3	45-128		%REC	255791	10	02/15/2018 16:44	RS
Surr: Tetrachloro-m-xylene	51.6	46-120		%REC	255791	10	02/15/2018 16:44	RS
PERCENT MOISTURE D2216								
Percent Moisture	32.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E22 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 9:33:00 AM
Lab ID:	1802987-060	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	79.0	10.2		mg/Kg-dry	255713	50	02/16/2018 22:26	DP
Copper	383	5.10		mg/Kg-dry	255713	50	02/16/2018 22:26	DP
Lead	857	2.55		mg/Kg-dry	255713	50	02/16/2018 22:26	DP
Zinc	951	25.5		mg/Kg-dry	255713	50	02/16/2018 22:26	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.94	0.25		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
4,4´-DDE	0.54	0.25		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
4,4´-DDT	11	2.5		mg/Kg-dry	255791	500	02/17/2018 03:33	RS
alpha-BHC	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
alpha-Chlordane	0.40	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
beta-BHC	0.78	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
delta-BHC	0.17	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
Dieldrin	1.0	0.25		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
gamma-BHC	0.15	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
gamma-Chlordane	1.0	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
Heptachlor	BRL	0.13		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
Methoxychlor	BRL	1.3		mg/Kg-dry	255791	50	02/15/2018 22:38	RS
Toxaphene	BRL	130		mg/Kg-dry	255791	500	02/17/2018 03:33	RS
Surr: Decachlorobiphenyl	120	45-128		%REC	255791	50	02/15/2018 22:38	RS
Surr: Tetrachloro-m-xylene	71.9	46-120		%REC	255791	50	02/15/2018 22:38	RS
PERCENT MOISTURE D2216								
Percent Moisture	34.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	A24 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 9:40:00 AM
Lab ID:	1802987-061	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	18.4	8.19		mg/Kg-dry	255765	50	02/19/2018 15:06	DP
Copper	117	5.46		mg/Kg-dry	255765	50	02/19/2018 15:06	DP
Lead	180	2.73		mg/Kg-dry	255765	50	02/19/2018 15:06	DP
Zinc	524	27.3		mg/Kg-dry	255765	50	02/19/2018 15:06	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.051	0.023		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
4,4´-DDE	0.16	0.023		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
4,4´-DDT	2.1	0.23		mg/Kg-dry	255896	50	02/19/2018 10:47	RS
alpha-BHC	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
alpha-Chlordane	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
beta-BHC	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
delta-BHC	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
Dieldrin	BRL	0.023		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
gamma-BHC	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
gamma-Chlordane	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
Heptachlor	BRL	0.012		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
Methoxychlor	BRL	0.12		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
Toxaphene	1.4	1.2		mg/Kg-dry	255896	5	02/16/2018 18:52	SH
Surr: Decachlorobiphenyl	83.3	45-128		%REC	255896	5	02/16/2018 18:52	SH
Surr: Tetrachloro-m-xylene	76.5	46-120		%REC	255896	5	02/16/2018 18:52	SH
PERCENT MOISTURE D2216								
Percent Moisture	28.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E21 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 9:43:00 AM
Lab ID:	1802987-062	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	15.1	9.94		mg/Kg-dry	255765	100	02/20/2018 13:00	DP
Copper	629	8.28		mg/Kg-dry	255765	100	02/20/2018 13:00	DP
Lead	1540	4.14		mg/Kg-dry	255765	100	02/20/2018 13:00	DP
Zinc	733	41.4		mg/Kg-dry	255765	100	02/20/2018 13:00	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.22		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
4,4´-DDE	0.49	0.22		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
4,4´-DDT	0.68	0.22		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
beta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
delta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
Dieldrin	BRL	0.22		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
Heptachlor	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
Toxaphene	BRL	11		mg/Kg-dry	255896	50	02/16/2018 19:59	SH
Surr: Decachlorobiphenyl	98.8	45-128		%REC	255896	50	02/16/2018 19:59	SH
Surr: Tetrachloro-m-xylene	87.6	46-120		%REC	255896	50	02/16/2018 19:59	SH
PERCENT MOISTURE D2216								
Percent Moisture	23.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E20 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 9:56:00 AM
Lab ID:	1802987-063	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.42		mg/Kg-dry	255765	100	02/20/2018 13:02	DP
Copper	34.2	4.47		mg/Kg-dry	255765	50	02/19/2018 15:15	DP
Lead	92.7	4.47		mg/Kg-dry	255765	100	02/20/2018 13:02	DP
Zinc	141	44.7		mg/Kg-dry	255765	100	02/20/2018 13:02	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.22		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
4,4´-DDE	BRL	0.22		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
4,4´-DDT	BRL	0.22		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
beta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
delta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
Dieldrin	BRL	0.22		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
Heptachlor	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
Toxaphene	BRL	11		mg/Kg-dry	255896	50	02/16/2018 20:10	SH
Surr: Decachlorobiphenyl	80.1	45-128		%REC	255896	50	02/16/2018 20:10	SH
Surr: Tetrachloro-m-xylene	88.3	46-120		%REC	255896	50	02/16/2018 20:10	SH
PERCENT MOISTURE D2216								
Percent Moisture	25.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E19 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 10:10:00 AM
Lab ID:	1802987-064	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	11.2	7.69		mg/Kg-dry	255765	100	02/20/2018 13:04	DP
Copper	36.9	3.85		mg/Kg-dry	255765	50	02/19/2018 15:35	DP
Lead	388	3.85		mg/Kg-dry	255765	100	02/20/2018 13:04	DP
Zinc	363	38.5		mg/Kg-dry	255765	100	02/20/2018 13:04	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.42		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
4,4´-DDE	0.67	0.42		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
4,4´-DDT	0.87	0.42		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
alpha-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
alpha-Chlordane	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
beta-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
delta-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
Dieldrin	BRL	0.42		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
gamma-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
gamma-Chlordane	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
Heptachlor	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
Methoxychlor	BRL	2.1		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
Toxaphene	BRL	21		mg/Kg-dry	255896	100	02/16/2018 19:03	SH
Surr: Decachlorobiphenyl	102	45-128		%REC	255896	100	02/16/2018 19:03	SH
Surr: Tetrachloro-m-xylene	106	46-120		%REC	255896	100	02/16/2018 19:03	SH
PERCENT MOISTURE D2216								
Percent Moisture	20.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	A25 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 10:20:00 AM
Lab ID:	1802987-065	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	11.8	9.79		mg/Kg-dry	255765	50	02/19/2018 15:40	DP
Copper	87.4	6.53		mg/Kg-dry	255765	50	02/19/2018 15:40	DP
Lead	102	3.26		mg/Kg-dry	255765	50	02/19/2018 15:40	DP
Zinc	259	32.6		mg/Kg-dry	255765	50	02/19/2018 15:40	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.046		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
4,4´-DDE	0.100	0.046		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
4,4´-DDT	0.15	0.046		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
alpha-BHC	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
alpha-Chlordane	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
beta-BHC	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
delta-BHC	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
Dieldrin	BRL	0.046		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
gamma-BHC	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
gamma-Chlordane	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
Heptachlor	BRL	0.023		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
Methoxychlor	BRL	0.23		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
Toxaphene	BRL	2.3		mg/Kg-dry	255896	10	02/16/2018 22:24	SH
Surr: Decachlorobiphenyl	93.4	45-128		%REC	255896	10	02/16/2018 22:24	SH
Surr: Tetrachloro-m-xylene	77.2	46-120		%REC	255896	10	02/16/2018 22:24	SH
PERCENT MOISTURE D2216								
Percent Moisture	27.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E18 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 10:22:00 AM
Lab ID:	1802987-066	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	7.67	7.44		mg/Kg-dry	255765	50	02/19/2018 15:45	DP
Copper	140	4.96		mg/Kg-dry	255765	50	02/19/2018 15:45	DP
Lead	718	2.48		mg/Kg-dry	255765	50	02/19/2018 15:45	DP
Zinc	767	24.8		mg/Kg-dry	255765	50	02/20/2018 19:26	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.47		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
4,4´-DDE	0.66	0.47		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
4,4´-DDT	2.0	0.47		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
alpha-BHC	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
alpha-Chlordane	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
beta-BHC	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
delta-BHC	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
Dieldrin	BRL	0.47		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
gamma-BHC	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
gamma-Chlordane	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
Heptachlor	BRL	0.24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
Methoxychlor	BRL	2.4		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
Toxaphene	BRL	24		mg/Kg-dry	255896	100	02/16/2018 19:15	SH
Surr: Decachlorobiphenyl	76.8	45-128		%REC	255896	100	02/16/2018 19:15	SH
Surr: Tetrachloro-m-xylene	73.6	46-120		%REC	255896	100	02/16/2018 19:15	SH
PERCENT MOISTURE D2216								
Percent Moisture	29.2	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	A26 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 10:45:00 AM
Lab ID:	1802987-067	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	28.0	16.8		mg/Kg-dry	255765	50	02/19/2018 15:50	DP
Copper	62.3	11.2		mg/Kg-dry	255765	50	02/19/2018 15:50	DP
Lead	407	5.60		mg/Kg-dry	255765	50	02/19/2018 15:50	DP
Zinc	168	56.0		mg/Kg-dry	255765	50	02/19/2018 15:50	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.084		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
4,4´-DDE	0.68	0.084		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
4,4´-DDT	0.19	0.084		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
alpha-BHC	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
alpha-Chlordane	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
beta-BHC	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
delta-BHC	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
Dieldrin	BRL	0.084		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
gamma-BHC	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
gamma-Chlordane	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
Heptachlor	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
Methoxychlor	BRL	0.42		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
Toxaphene	BRL	4.2		mg/Kg-dry	255896	10	02/16/2018 22:35	SH
Surr: Decachlorobiphenyl	94.9	45-128		%REC	255896	10	02/16/2018 22:35	SH
Surr: Tetrachloro-m-xylene	88.7	46-120		%REC	255896	10	02/16/2018 22:35	SH
PERCENT MOISTURE D2216								
Percent Moisture	60.6	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D14 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 11:30:00 AM
Lab ID:	1802987-068	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	65.3	9.61		mg/Kg-dry	255765	50	02/19/2018 15:55	DP
Copper	283	6.40		mg/Kg-dry	255765	50	02/19/2018 15:55	DP
Lead	990	3.20		mg/Kg-dry	255765	50	02/19/2018 15:55	DP
Zinc	1110	32.0		mg/Kg-dry	255765	50	02/20/2018 19:28	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.39	0.22		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
4,4´-DDE	1.8	0.22		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
4,4´-DDT	4.6	0.22		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
alpha-Chlordane	0.25	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
beta-BHC	0.13	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
delta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
Dieldrin	1.3	0.22		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
gamma-Chlordane	0.28	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
Heptachlor	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
Toxaphene	16	11		mg/Kg-dry	255896	50	02/16/2018 20:21	SH
Surr: Decachlorobiphenyl	119	45-128		%REC	255896	50	02/16/2018 20:21	SH
Surr: Tetrachloro-m-xylene	112	46-120		%REC	255896	50	02/16/2018 20:21	SH
PERCENT MOISTURE D2216								
Percent Moisture	25.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D13 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 11:50:00 AM
Lab ID:	1802987-069	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	64.8	8.15		mg/Kg-dry	255765	50	02/19/2018 16:00	DP
Copper	327	5.44		mg/Kg-dry	255765	50	02/19/2018 16:00	DP
Lead	1110	2.72		mg/Kg-dry	255765	50	02/19/2018 16:00	DP
Zinc	971	27.2		mg/Kg-dry	255765	50	02/20/2018 19:30	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.22	0.21		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
4,4´-DDE	1.2	0.21		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
4,4´-DDT	2.6	0.21		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
alpha-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
alpha-Chlordane	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
beta-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
delta-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
Dieldrin	0.47	0.21		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
gamma-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
gamma-Chlordane	0.22	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
Heptachlor	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
Methoxychlor	BRL	1.0		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
Toxaphene	BRL	10		mg/Kg-dry	255896	50	02/16/2018 20:33	SH
Surr: Decachlorobiphenyl	98.4	45-128		%REC	255896	50	02/16/2018 20:33	SH
Surr: Tetrachloro-m-xylene	94.4	46-120		%REC	255896	50	02/16/2018 20:33	SH
PERCENT MOISTURE D2216								
Percent Moisture	19.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E17 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 11:56:00 AM
Lab ID:	1802987-070	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	11.6	7.54		mg/Kg-dry	255765	100	02/20/2018 13:12	DP
Copper	215	3.66		mg/Kg-dry	255765	50	02/19/2018 16:05	DP
Lead	922	3.66		mg/Kg-dry	255765	100	02/20/2018 13:12	DP
Zinc	751	36.6		mg/Kg-dry	255765	100	02/20/2018 13:12	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.41		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
4,4´-DDE	0.62	0.41		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
4,4´-DDT	2.8	0.41		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
alpha-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
alpha-Chlordane	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
beta-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
delta-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
Dieldrin	0.53	0.41		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
gamma-BHC	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
gamma-Chlordane	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
Heptachlor	BRL	0.21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
Methoxychlor	BRL	2.1		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
Toxaphene	BRL	21		mg/Kg-dry	255896	100	02/16/2018 19:26	SH
Surr: Decachlorobiphenyl	110	45-128		%REC	255896	100	02/16/2018 19:26	SH
Surr: Tetrachloro-m-xylene	100	46-120		%REC	255896	100	02/16/2018 19:26	SH
PERCENT MOISTURE D2216								
Percent Moisture	19.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E16 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 12:05:00 PM
Lab ID:	1802987-071	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	23.3	10.5		mg/Kg-dry	255765	50	02/19/2018 16:09	DP
Copper	97.7	7.02		mg/Kg-dry	255765	50	02/19/2018 16:09	DP
Lead	295	3.51		mg/Kg-dry	255765	50	02/19/2018 16:09	DP
Zinc	255	35.1		mg/Kg-dry	255765	50	02/19/2018 16:09	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.48	0.24		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
4,4´-DDE	0.96	0.24		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
4,4´-DDT	5.5	0.24		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
alpha-BHC	BRL	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
alpha-Chlordane	0.46	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
beta-BHC	BRL	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
delta-BHC	BRL	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
Dieldrin	BRL	0.24		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
gamma-BHC	BRL	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
gamma-Chlordane	0.38	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
Heptachlor	BRL	0.12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
Methoxychlor	BRL	1.2		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
Toxaphene	16	12		mg/Kg-dry	255896	50	02/16/2018 20:44	SH
Surr: Decachlorobiphenyl	120	45-128		%REC	255896	50	02/16/2018 20:44	SH
Surr: Tetrachloro-m-xylene	90	46-120		%REC	255896	50	02/16/2018 20:44	SH
PERCENT MOISTURE D2216								
Percent Moisture	29.3	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D12 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 12:10:00 PM
Lab ID:	1802987-072	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	125	7.77		mg/Kg-dry	255765	50	02/19/2018 16:14	DP
Copper	457	5.18		mg/Kg-dry	255765	50	02/19/2018 16:14	DP
Lead	1720	2.59		mg/Kg-dry	255765	50	02/19/2018 16:14	DP
Zinc	1530	25.9		mg/Kg-dry	255765	50	02/20/2018 19:32	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.44		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
4,4´-DDE	1.2	0.44		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
4,4´-DDT	2.7	0.44		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
alpha-BHC	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
alpha-Chlordane	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
beta-BHC	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
delta-BHC	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
Dieldrin	BRL	0.44		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
gamma-BHC	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
gamma-Chlordane	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
Heptachlor	BRL	0.22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
Methoxychlor	BRL	2.2		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
Toxaphene	BRL	22		mg/Kg-dry	255896	100	02/16/2018 19:37	SH
Surr: Decachlorobiphenyl	144	45-128	S	%REC	255896	100	02/16/2018 19:37	SH
Surr: Tetrachloro-m-xylene	51.2	46-120		%REC	255896	100	02/16/2018 19:37	SH
PERCENT MOISTURE D2216								
Percent Moisture	24.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E15 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 12:27:00 PM
Lab ID:	1802987-073	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	66.4	9.33		mg/Kg-dry	255765	50	02/19/2018 16:19	DP
Copper	411	6.22		mg/Kg-dry	255765	50	02/19/2018 16:19	DP
Lead	590	3.11		mg/Kg-dry	255765	50	02/19/2018 16:19	DP
Zinc	4620	31.1		mg/Kg-dry	255765	50	02/20/2018 19:34	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.043		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
4,4´-DDE	0.14	0.043		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
4,4´-DDT	0.21	0.043		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
alpha-BHC	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
alpha-Chlordane	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
beta-BHC	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
delta-BHC	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
Dieldrin	BRL	0.043		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
gamma-BHC	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
gamma-Chlordane	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
Heptachlor	BRL	0.022		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
Methoxychlor	BRL	0.22		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
Toxaphene	BRL	2.2		mg/Kg-dry	255896	10	02/16/2018 22:46	SH
Surr: Decachlorobiphenyl	75.9	45-128		%REC	255896	10	02/16/2018 22:46	SH
Surr: Tetrachloro-m-xylene	77.4	46-120		%REC	255896	10	02/16/2018 22:46	SH
PERCENT MOISTURE D2216								
Percent Moisture	22.6	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D10 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 12:40:00 PM
Lab ID:	1802987-074	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	12.7	8.87		mg/Kg-dry	255765	50	02/19/2018 16:49	DP
Copper	54.1	5.91		mg/Kg-dry	255765	50	02/19/2018 16:49	DP
Lead	219	2.96		mg/Kg-dry	255765	50	02/19/2018 16:49	DP
Zinc	143	29.6		mg/Kg-dry	255765	50	02/19/2018 16:49	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.50		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
4,4´-DDE	2.8	0.50		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
4,4´-DDT	8.6	0.50		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
alpha-BHC	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
alpha-Chlordane	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
beta-BHC	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
delta-BHC	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
Dieldrin	BRL	0.50		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
gamma-BHC	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
gamma-Chlordane	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
Heptachlor	BRL	0.25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
Methoxychlor	BRL	2.5		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
Toxaphene	BRL	25		mg/Kg-dry	255896	100	02/16/2018 19:48	SH
Surr: Decachlorobiphenyl	101	45-128		%REC	255896	100	02/16/2018 19:48	SH
Surr: Tetrachloro-m-xylene	77.4	46-120		%REC	255896	100	02/16/2018 19:48	SH
PERCENT MOISTURE D2216								
Percent Moisture	33.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E14 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 3:52:00 PM
Lab ID:	1802987-075	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	122	8.57		mg/Kg-dry	255765	100	02/20/2018 13:17	DP
Copper	907	7.14		mg/Kg-dry	255765	100	02/20/2018 13:17	DP
Lead	1060	3.57		mg/Kg-dry	255765	100	02/20/2018 13:17	DP
Zinc	933	35.7		mg/Kg-dry	255765	100	02/20/2018 13:17	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.043		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
4,4´-DDE	0.12	0.043		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
4,4´-DDT	0.14	0.043		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
alpha-BHC	0.025	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
alpha-Chlordane	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
beta-BHC	0.025	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
delta-BHC	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
Dieldrin	BRL	0.043		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
gamma-BHC	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
gamma-Chlordane	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
Heptachlor	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
Methoxychlor	BRL	0.21		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
Toxaphene	BRL	2.1		mg/Kg-dry	255896	10	02/16/2018 22:58	SH
Surr: Decachlorobiphenyl	86.3	45-128		%REC	255896	10	02/16/2018 22:58	SH
Surr: Tetrachloro-m-xylene	81.6	46-120		%REC	255896	10	02/16/2018 22:58	SH
PERCENT MOISTURE D2216								
Percent Moisture	21.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E13 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 1:04:00 PM
Lab ID:	1802987-076	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	331	8.36		mg/Kg-dry	255765	50	02/19/2018 16:59	DP
Copper	454	5.57		mg/Kg-dry	255765	50	02/19/2018 16:59	DP
Lead	2820	2.79		mg/Kg-dry	255765	50	02/19/2018 16:59	DP
Zinc	2050	27.9		mg/Kg-dry	255765	50	02/20/2018 19:35	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.23		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
4,4´-DDE	0.52	0.23		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
4,4´-DDT	0.68	0.23		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
beta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
delta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
Dieldrin	BRL	0.23		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
Heptachlor	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
Toxaphene	BRL	11		mg/Kg-dry	255896	50	02/16/2018 20:55	SH
Surr: Decachlorobiphenyl	101	45-128		%REC	255896	50	02/16/2018 20:55	SH
Surr: Tetrachloro-m-xylene	105	46-120		%REC	255896	50	02/16/2018 20:55	SH
PERCENT MOISTURE D2216								
Percent Moisture	26.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	D11 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 1:10:00 PM
Lab ID:	1802987-077	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	8.00		mg/Kg-dry	255765	200	02/20/2018 13:19	DP
Copper	31.5	4.00		mg/Kg-dry	255765	50	02/19/2018 17:04	DP
Lead	70.3	8.00		mg/Kg-dry	255765	200	02/20/2018 13:19	DP
Zinc	90.0	80.0		mg/Kg-dry	255765	200	02/20/2018 13:19	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.042		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
4,4´-DDE	0.83	0.042		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
4,4´-DDT	0.78	0.042		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
alpha-BHC	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
alpha-Chlordane	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
beta-BHC	0.041	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
delta-BHC	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
Dieldrin	0.081	0.042		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
gamma-BHC	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
gamma-Chlordane	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
Heptachlor	BRL	0.021		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
Methoxychlor	BRL	0.21		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
Toxaphene	BRL	2.1		mg/Kg-dry	255896	10	02/16/2018 23:09	SH
Surr: Decachlorobiphenyl	88.9	45-128		%REC	255896	10	02/16/2018 23:09	SH
Surr: Tetrachloro-m-xylene	89.1	46-120		%REC	255896	10	02/16/2018 23:09	SH
PERCENT MOISTURE D2216								
Percent Moisture	21.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E12 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 1:34:00 PM
Lab ID:	1802987-078	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	8.09	7.37		mg/Kg-dry	255765	50	02/19/2018 17:09	DP
Copper	146	5.46		mg/Kg-dry	255765	50	02/19/2018 17:09	DP
Lead	84.7	2.73		mg/Kg-dry	255765	50	02/19/2018 17:09	DP
Zinc	293	27.3		mg/Kg-dry	255765	50	02/19/2018 17:09	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.37	0.090		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
4,4´-DDE	1.1	0.090		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
4,4´-DDT	6.2	0.90		mg/Kg-dry	255896	200	02/19/2018 11:35	RS
alpha-BHC	BRL	0.045		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
alpha-Chlordane	1.2	0.045		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
beta-BHC	1.7	0.45		mg/Kg-dry	255896	200	02/19/2018 11:35	RS
delta-BHC	BRL	0.045		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
Dieldrin	0.77	0.090		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
gamma-BHC	BRL	0.045		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
gamma-Chlordane	2.1	0.45		mg/Kg-dry	255896	200	02/19/2018 11:35	RS
Heptachlor	0.42	0.045		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
Methoxychlor	BRL	0.45		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
Toxaphene	BRL	4.5		mg/Kg-dry	255896	20	02/16/2018 23:20	SH
Surr: Decachlorobiphenyl	65.7	45-128		%REC	255896	20	02/16/2018 23:20	SH
Surr: Tetrachloro-m-xylene	61.8	46-120		%REC	255896	20	02/16/2018 23:20	SH
PERCENT MOISTURE D2216								
Percent Moisture	26.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B10 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 1:40:00 PM
Lab ID:	1802987-079	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.46		mg/Kg-dry	255765	50	02/19/2018 17:13	DP
Copper	15.1	5.83		mg/Kg-dry	255765	50	02/19/2018 17:13	DP
Lead	38.6	2.91		mg/Kg-dry	255765	50	02/19/2018 17:13	DP
Zinc	91.8	29.1		mg/Kg-dry	255765	50	02/19/2018 17:13	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.21		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
4,4´-DDE	0.67	0.21		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
4,4´-DDT	1.9	0.21		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
alpha-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
alpha-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
beta-BHC	0.12	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
delta-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
Dieldrin	BRL	0.21		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
gamma-BHC	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
gamma-Chlordane	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
Heptachlor	BRL	0.11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
Methoxychlor	BRL	1.1		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
Toxaphene	BRL	11		mg/Kg-dry	255896	50	02/16/2018 22:02	SH
Surr: Decachlorobiphenyl	105	45-128		%REC	255896	50	02/16/2018 22:02	SH
Surr: Tetrachloro-m-xylene	75.7	46-120		%REC	255896	50	02/16/2018 22:02	SH
PERCENT MOISTURE D2216								
Percent Moisture	20.9	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E11 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 1:42:00 PM
Lab ID:	1802987-080	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	495	363		mg/Kg-dry	255765	50	02/19/2018 14:41	DP
Copper	2360	4.84		mg/Kg-dry	255765	50	02/20/2018 19:10	DP
Lead	4340	2.42		mg/Kg-dry	255765	50	02/19/2018 14:41	DP
Zinc	4730	24.2		mg/Kg-dry	255765	50	02/20/2018 19:10	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.20		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
4,4´-DDE	0.33	0.20		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
4,4´-DDT	0.96	0.20		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
alpha-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
alpha-Chlordane	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
beta-BHC	0.21	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
delta-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
Dieldrin	0.28	0.20		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
gamma-BHC	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
gamma-Chlordane	0.16	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
Heptachlor	BRL	0.10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
Methoxychlor	BRL	1.0		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
Toxaphene	BRL	10		mg/Kg-dry	255896	50	02/16/2018 22:13	SH
Surr: Decachlorobiphenyl	105	45-128		%REC	255896	50	02/16/2018 22:13	SH
Surr: Tetrachloro-m-xylene	84.9	46-120		%REC	255896	50	02/16/2018 22:13	SH
PERCENT MOISTURE D2216								
Percent Moisture	18.0	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E10 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 2:00:00 PM
Lab ID:	1802987-081	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	257	8.72		mg/Kg-dry	255768	50	02/16/2018 19:07	DP
Copper	240	5.81		mg/Kg-dry	255768	50	02/16/2018 19:07	DP
Lead	1410	2.91		mg/Kg-dry	255768	50	02/16/2018 19:07	DP
Zinc	587	29.1		mg/Kg-dry	255768	50	02/16/2018 19:07	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.21		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
4,4´-DDE	2.1	0.21		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
4,4´-DDT	2.8	0.21		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
alpha-BHC	BRL	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
alpha-Chlordane	BRL	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
beta-BHC	0.17	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
delta-BHC	BRL	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
Dieldrin	0.24	0.21		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
gamma-BHC	BRL	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
gamma-Chlordane	0.12	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
Heptachlor	BRL	0.11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
Methoxychlor	BRL	1.1		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
Toxaphene	BRL	11		mg/Kg-dry	255820	50	02/15/2018 22:54	RS
Surr: Decachlorobiphenyl	129	45-128	S	%REC	255820	50	02/15/2018 22:54	RS
Surr: Tetrachloro-m-xylene	78.2	46-120		%REC	255820	50	02/15/2018 22:54	RS
PERCENT MOISTURE D2216								
Percent Moisture	20.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B11 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 2:05:00 PM
Lab ID:	1802987-082	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.44		mg/Kg-dry	255768	50	02/16/2018 19:09	DP
Copper	18.5	5.13		mg/Kg-dry	255768	50	02/16/2018 19:09	DP
Lead	38.1	2.57		mg/Kg-dry	255768	50	02/16/2018 19:09	DP
Zinc	84.0	25.7		mg/Kg-dry	255768	50	02/16/2018 19:09	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.079		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
4,4´-DDE	0.24	0.079		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
4,4´-DDT	1.1	0.079		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
alpha-BHC	BRL	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
alpha-Chlordane	BRL	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
beta-BHC	0.11	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
delta-BHC	BRL	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
Dieldrin	BRL	0.079		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
gamma-BHC	BRL	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
gamma-Chlordane	BRL	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
Heptachlor	BRL	0.040		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
Methoxychlor	BRL	0.40		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
Toxaphene	BRL	4.0		mg/Kg-dry	255820	20	02/15/2018 21:02	RS
Surr: Decachlorobiphenyl	93.5	45-128		%REC	255820	20	02/15/2018 21:02	RS
Surr: Tetrachloro-m-xylene	68.6	46-120		%REC	255820	20	02/15/2018 21:02	RS
PERCENT MOISTURE D2216								
Percent Moisture	16.0	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	E9 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 2:20:00 PM
Lab ID:	1802987-083	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	348	7.84		mg/Kg-dry	255768	50	02/16/2018 19:11	DP
Copper	478	5.22		mg/Kg-dry	255768	50	02/16/2018 19:11	DP
Lead	2470	2.61		mg/Kg-dry	255768	50	02/16/2018 19:11	DP
Zinc	788	26.1		mg/Kg-dry	255768	50	02/16/2018 19:11	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.42		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
4,4´-DDE	BRL	0.42		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
4,4´-DDT	0.99	0.42		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
alpha-BHC	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
alpha-Chlordane	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
beta-BHC	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
delta-BHC	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
Dieldrin	BRL	0.42		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
gamma-BHC	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
gamma-Chlordane	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
Heptachlor	BRL	0.21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
Methoxychlor	BRL	2.1		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
Toxaphene	BRL	21		mg/Kg-dry	255820	100	02/16/2018 02:06	RS
Surr: Decachlorobiphenyl	0	45-128	S	%REC	255820	100	02/16/2018 02:06	RS
Surr: Tetrachloro-m-xylene	0	46-120	S	%REC	255820	100	02/16/2018 02:06	RS
PERCENT MOISTURE D2216								
Percent Moisture	21.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C14 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 2:23:00 PM
Lab ID:	1802987-084	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	41.2	27.7		mg/Kg-dry	255768	200	02/20/2018 19:37	DP
Copper	43.9	18.5		mg/Kg-dry	255768	200	02/20/2018 19:37	DP
Lead	126	2.31		mg/Kg-dry	255768	50	02/16/2018 19:13	DP
Zinc	128	92.4		mg/Kg-dry	255768	200	02/20/2018 19:37	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.043		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
4,4´-DDE	0.093	0.043		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
4,4´-DDT	0.27	0.043		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
alpha-BHC	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
alpha-Chlordane	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
beta-BHC	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
delta-BHC	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
Dieldrin	0.055	0.043		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
gamma-BHC	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
gamma-Chlordane	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
Heptachlor	BRL	0.021		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
Methoxychlor	BRL	0.21		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
Toxaphene	BRL	2.1		mg/Kg-dry	255820	10	02/15/2018 17:00	RS
Surr: Decachlorobiphenyl	56.2	45-128		%REC	255820	10	02/15/2018 17:00	RS
Surr: Tetrachloro-m-xylene	51.3	46-120		%REC	255820	10	02/15/2018 17:00	RS
PERCENT MOISTURE D2216								
Percent Moisture	21.8	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	B12 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 2:35:00 PM
Lab ID:	1802987-085	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	24.3	7.96		mg/Kg-dry	255768	50	02/16/2018 19:15	DP
Copper	43.9	5.31		mg/Kg-dry	255768	50	02/16/2018 19:15	DP
Lead	204	2.65		mg/Kg-dry	255768	50	02/16/2018 19:15	DP
Zinc	134	26.5		mg/Kg-dry	255768	50	02/16/2018 19:15	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.084		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
4,4´-DDE	0.092	0.084		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
4,4´-DDT	0.14	0.084		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
alpha-BHC	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
alpha-Chlordane	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
beta-BHC	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
delta-BHC	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
Dieldrin	BRL	0.084		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
gamma-BHC	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
gamma-Chlordane	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
Heptachlor	BRL	0.042		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
Methoxychlor	BRL	0.42		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
Toxaphene	BRL	4.2		mg/Kg-dry	255820	20	02/15/2018 21:18	RS
Surr: Decachlorobiphenyl	88.8	45-128		%REC	255820	20	02/15/2018 21:18	RS
Surr: Tetrachloro-m-xylene	65.5	46-120		%REC	255820	20	02/15/2018 21:18	RS
PERCENT MOISTURE D2216								
Percent Moisture	20.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C13 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 2:48:00 PM
Lab ID:	1802987-086	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	17.2	7.67		mg/Kg-dry	255768	50	02/16/2018 19:17	DP
Copper	16.4	5.12		mg/Kg-dry	255768	50	02/16/2018 19:17	DP
Lead	65.7	2.56		mg/Kg-dry	255768	50	02/16/2018 19:17	DP
Zinc	49.7	25.6		mg/Kg-dry	255768	50	02/16/2018 19:17	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.044		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
4,4´-DDE	BRL	0.044		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
4,4´-DDT	0.069	0.044		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
alpha-BHC	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
alpha-Chlordane	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
beta-BHC	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
delta-BHC	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
Dieldrin	BRL	0.044		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
gamma-BHC	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
gamma-Chlordane	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
Heptachlor	BRL	0.022		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
Methoxychlor	BRL	0.22		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
Toxaphene	BRL	2.2		mg/Kg-dry	255820	10	02/15/2018 17:16	RS
Surr: Decachlorobiphenyl	89.1	45-128		%REC	255820	10	02/15/2018 17:16	RS
Surr: Tetrachloro-m-xylene	73.2	46-120		%REC	255820	10	02/15/2018 17:16	RS
PERCENT MOISTURE D2216								
Percent Moisture	23.5	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C12 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 3:14:00 PM
Lab ID:	1802987-087	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.43		mg/Kg-dry	255768	50	02/16/2018 19:19	DP
Copper	16.9	5.43		mg/Kg-dry	255768	50	02/16/2018 19:19	DP
Lead	57.2	2.71		mg/Kg-dry	255768	50	02/16/2018 19:19	DP
Zinc	79.9	27.1		mg/Kg-dry	255768	50	02/16/2018 19:19	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.020		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
4,4´-DDE	0.098	0.020		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
4,4´-DDT	0.20	0.020		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
alpha-BHC	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
alpha-Chlordane	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
beta-BHC	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
delta-BHC	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
Dieldrin	0.032	0.020		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
gamma-BHC	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
gamma-Chlordane	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
Heptachlor	BRL	0.010		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
Methoxychlor	BRL	0.10		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
Toxaphene	BRL	1.0		mg/Kg-dry	255820	5	02/15/2018 17:32	RS
Surr: Decachlorobiphenyl	68.6	45-128		%REC	255820	5	02/15/2018 17:32	RS
Surr: Tetrachloro-m-xylene	61.3	46-120		%REC	255820	5	02/15/2018 17:32	RS
PERCENT MOISTURE D2216								
Percent Moisture	17.1	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C11 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 3:39:00 PM
Lab ID:	1802987-088	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	BRL	7.44		mg/Kg-dry	255768	50	02/16/2018 19:21	DP
Copper	13.3	4.59		mg/Kg-dry	255768	50	02/16/2018 19:21	DP
Lead	37.9	2.30		mg/Kg-dry	255768	50	02/16/2018 19:21	DP
Zinc	61.8	23.0		mg/Kg-dry	255768	50	02/16/2018 19:21	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	BRL	0.038		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
4,4´-DDE	0.11	0.038		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
4,4´-DDT	0.19	0.038		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
alpha-BHC	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
alpha-Chlordane	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
beta-BHC	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
delta-BHC	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
Dieldrin	BRL	0.038		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
gamma-BHC	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
gamma-Chlordane	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
Heptachlor	BRL	0.019		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
Methoxychlor	BRL	0.19		mg/Kg-dry	255820	10	02/15/2018 17:48	RS
Toxaphene	BRL	19		mg/Kg-dry	255820	100	02/17/2018 00:53	RS
Surr: Decachlorobiphenyl	149	45-128	S	%REC	255820	10	02/15/2018 17:48	RS
Surr: Tetrachloro-m-xylene	65.7	46-120		%REC	255820	10	02/15/2018 17:48	RS
PERCENT MOISTURE D2216								
Percent Moisture	13.4	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 21-Feb-18

Client:	AMEC Foster Wheeler	**Client Sample ID:**	C8 (0-1) 020918
Project Name:	BFEL - Atlanta	**Collection Date:**	2/9/2018 4:42:00 PM
Lab ID:	1802987-089	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Metals by ICP/MS SW6020B				**(SW3050B)**				
Arsenic	102	37.1		mg/Kg-dry	255768	50	02/16/2018 18:42	DP
Copper	268	4.94		mg/Kg-dry	255768	50	02/16/2018 18:42	DP
Lead	1510	2.47		mg/Kg-dry	255768	50	02/16/2018 18:42	DP
Zinc	893	24.7		mg/Kg-dry	255768	50	02/16/2018 18:42	DP
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**				
4,4´-DDD	0.36	0.085		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
4,4´-DDE	1.6	0.085		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
4,4´-DDT	16	0.85		mg/Kg-dry	255820	200	02/17/2018 01:09	RS
alpha-BHC	0.080	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
alpha-Chlordane	0.20	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
beta-BHC	1.3	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
delta-BHC	0.057	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
Dieldrin	0.63	0.085		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
gamma-BHC	0.060	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
gamma-Chlordane	0.61	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
Heptachlor	BRL	0.043		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
Methoxychlor	BRL	0.43		mg/Kg-dry	255820	20	02/15/2018 21:34	RS
Toxaphene	BRL	43		mg/Kg-dry	255820	200	02/17/2018 01:09	RS
Surr: Decachlorobiphenyl	378	45-128	S	%REC	255820	20	02/15/2018 21:34	RS
Surr: Tetrachloro-m-xylene	69.3	46-120		%REC	255820	20	02/15/2018 21:34	RS
PERCENT MOISTURE D2216								
Percent Moisture	22.0	0		wt%	R363298	1	02/16/2018 13:00	OO

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C32 (0-1) 020618				**Lab ID:** 1802987-001			
Collection Date: 2/6/2018 11:24:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	68.5		2.65	9.20	mg/Kg-dry	255704	50
Copper	52.0		3.12	6.13	mg/Kg-dry	255704	50
Lead	997		1.76	3.07	mg/Kg-dry	255704	50
Zinc	189		3.07	30.7	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.053		0.0053	0.023	mg/Kg-dry	255725	5
4,4´-DDT	0.037		0.0051	0.023	mg/Kg-dry	255725	5
PERCENT MOISTURE D2216							
Percent Moisture	26.4		0	0	wt%	R363298	1
Client Sample ID: C31 (0-1) 020618				**Lab ID:** 1802987-002			
Collection Date: 2/6/2018 11:25:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	26.2		2.26	7.86	mg/Kg-dry	255704	50
Copper	37.8		2.66	5.24	mg/Kg-dry	255704	50
Lead	295		1.50	2.62	mg/Kg-dry	255704	50
Zinc	134		2.62	26.2	mg/Kg-dry	255704	50
PERCENT MOISTURE D2216							
Percent Moisture	27.1		0	0	wt%	R363298	1
Client Sample ID: D31 (0-1) 020618				**Lab ID:** 1802987-003			
Collection Date: 2/6/2018 11:35:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	29.7		5.68	11.2	mg/Kg-dry	255704	100
Lead	156		1.60	2.79	mg/Kg-dry	255704	50
Zinc	554		5.59	55.9	mg/Kg-dry	255704	100
PERCENT MOISTURE D2216							
Percent Moisture	31.3		0	0	wt%	R363298	1
Client Sample ID: C30 (0-1) 020618				**Lab ID:** 1802987-004			
Collection Date: 2/6/2018 12:03:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	5.77		4.97	4.89	mg/Kg-dry	255704	100
Lead	49.7		1.40	2.44	mg/Kg-dry	255704	50
Zinc	68.6		4.89	48.9	mg/Kg-dry	255704	100
PERCENT MOISTURE D2216							
Percent Moisture	27.3		0	0	wt%	R363298	1
Client Sample ID: D30 (0-1) 020618				**Lab ID:** 1802987-005			
Collection Date: 2/6/2018 1:50:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	13.4		2.08	7.71	mg/Kg-dry	255704	50
Copper	22.4		2.45	4.82	mg/Kg-dry	255704	50
Lead	270		1.38	2.41	mg/Kg-dry	255704	50
Zinc	122		2.41	24.1	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D30 (0-1) 020618				**Lab ID:** 1802987-005			
Collection Date: 2/6/2018 1:50:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.086		0.0052	0.022	mg/Kg-dry	255725	5
4,4´-DDT	0.065		0.0050	0.022	mg/Kg-dry	255725	5
PERCENT MOISTURE D2216							
Percent Moisture	24.3		0	0	wt%	R363298	1
Client Sample ID: D32 (0-1) 020618				**Lab ID:** 1802987-006			
Collection Date: 2/6/2018 1:58:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	22.1		2.60	5.12	mg/Kg-dry	255704	50
Lead	222		1.47	2.56	mg/Kg-dry	255704	50
Zinc	533		2.56	25.6	mg/Kg-dry	255704	50
PERCENT MOISTURE D2216							
Percent Moisture	29.0		0	0	wt%	R363298	1
Client Sample ID: E30 (0-1) 020618				**Lab ID:** 1802987-007			
Collection Date: 2/6/2018 2:00:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	8.02		2.07	7.67	mg/Kg-dry	255704	50
Copper	23.6		2.44	4.79	mg/Kg-dry	255704	50
Lead	353		1.37	2.40	mg/Kg-dry	255704	50
Zinc	747		2.40	24.0	mg/Kg-dry	255704	50
PERCENT MOISTURE D2216							
Percent Moisture	25.8		0	0	wt%	R363298	1
Client Sample ID: D33 (0-1) 020618				**Lab ID:** 1802987-008			
Collection Date: 2/6/2018 2:02:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	12.9		3.91	8.15	mg/Kg-dry	255704	100
Copper	24.3		4.60	9.06	mg/Kg-dry	255704	100
Lead	210		1.30	2.27	mg/Kg-dry	255704	50
Zinc	192		4.53	45.3	mg/Kg-dry	255704	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.47		0.083	0.43	mg/Kg-dry	255725	100
4,4´-DDE	0.70		0.10	0.43	mg/Kg-dry	255725	100
4,4´-DDT	8.0		0.098	0.43	mg/Kg-dry	255725	100
PERCENT MOISTURE D2216							
Percent Moisture	22.8		0	0	wt%	R363298	1
Client Sample ID: E29 (0-1) 020618				**Lab ID:** 1802987-009			
Collection Date: 2/6/2018 2:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	23.8		2.36	8.21	mg/Kg-dry	255704	50
Copper	44.0		2.78	5.47	mg/Kg-dry	255704	50
Lead	566		1.57	2.74	mg/Kg-dry	255704	50
Zinc	242		2.74	27.4	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E29 (0-1) 020618				**Lab ID:** 1802987-009			
Collection Date: 2/6/2018 2:10:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	1.3		0.12	0.51	mg/Kg-dry	255725	100
4,4´-DDT	1.1		0.12	0.51	mg/Kg-dry	255725	100
PERCENT MOISTURE D2216							
Percent Moisture	34.9		0	0	wt%	R363298	1
Client Sample ID: E28 (0-1) 020618				**Lab ID:** 1802987-010			
Collection Date: 2/6/2018 2:25:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	41.7		4.34	15.1	mg/Kg-dry	255704	100
Copper	45.7		5.11	10.1	mg/Kg-dry	255704	100
Lead	1780		1.44	2.51	mg/Kg-dry	255704	50
Zinc	245		5.03	50.3	mg/Kg-dry	255704	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.14		0.010	0.044	mg/Kg-dry	255725	10
4,4´-DDT	0.14		0.010	0.044	mg/Kg-dry	255725	10
PERCENT MOISTURE D2216							
Percent Moisture	24.7		0	0	wt%	R363298	1
Client Sample ID: E31 (0-1) 020618				**Lab ID:** 1802987-011			
Collection Date: 2/6/2018 2:32:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	8.09		4.34	7.55	mg/Kg-dry	255704	100
Copper	19.2		5.11	10.1	mg/Kg-dry	255704	100
Lead	102		1.44	2.52	mg/Kg-dry	255704	50
Zinc	198		5.04	50.3	mg/Kg-dry	255704	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.070		0.011	0.047	mg/Kg-dry	255725	10
4,4´-DDT	0.16		0.011	0.047	mg/Kg-dry	255725	10
PERCENT MOISTURE D2216							
Percent Moisture	29.5		0	0	wt%	R363298	1
Client Sample ID: D34 (0-1) 020618				**Lab ID:** 1802987-012			
Collection Date: 2/6/2018 2:34:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	27.2		2.00	7.88	mg/Kg-dry	255704	50
Copper	28.7		2.36	4.64	mg/Kg-dry	255704	50
Lead	84.7		1.33	2.32	mg/Kg-dry	255704	50
Zinc	63.6		2.32	23.2	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.038		0.0020	0.0085	mg/Kg-dry	255725	2
4,4´-DDT	0.014		0.0019	0.0085	mg/Kg-dry	255725	2
PERCENT MOISTURE D2216							
Percent Moisture	21.7		0	0	wt%	R363298	1
Client Sample ID: E32 (0-1) 020618				**Lab ID:** 1802987-013			
Collection Date: 2/6/2018 3:10:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E32 (0-1) 020618				**Lab ID:** 1802987-013			
Collection Date: 2/6/2018 3:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	11.4		2.28	7.93	mg/Kg-dry	255704	50
Copper	24.6		2.69	5.29	mg/Kg-dry	255704	50
Lead	399		1.52	2.64	mg/Kg-dry	255704	50
Zinc	890		2.65	26.4	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.18		0.023	0.099	mg/Kg-dry	255725	20
4,4´-DDT	0.65		0.023	0.099	mg/Kg-dry	255725	20
PERCENT MOISTURE D2216							
Percent Moisture	32.9		0	0	wt%	R363298	1
Client Sample ID: E33 (0-1) 020618				**Lab ID:** 1802987-014			
Collection Date: 2/6/2018 3:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	10.8		3.94	8.21	mg/Kg-dry	255704	100
Copper	17.2		4.64	9.13	mg/Kg-dry	255704	100
Lead	120		1.31	2.28	mg/Kg-dry	255704	50
Zinc	127		4.57	45.6	mg/Kg-dry	255704	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	10		0.81	4.2	mg/Kg-dry	255725	1000
4,4´-DDT	340		9.5	42	mg/Kg-dry	255725	10000
PERCENT MOISTURE D2216							
Percent Moisture	20.4		0	0	wt%	R363298	1
Client Sample ID: E27 (0-1) 020618				**Lab ID:** 1802987-015			
Collection Date: 2/6/2018 3:30:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	253		2.26	7.87	mg/Kg-dry	255704	50
Copper	120		2.67	5.25	mg/Kg-dry	255704	50
Lead	78400		6.02	10.5	mg/Kg-dry	255704	200
Zinc	230		2.63	26.2	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.40		0.012	0.049	mg/Kg-dry	255725	10
4,4´-DDT	0.25		0.011	0.049	mg/Kg-dry	255725	10
PERCENT MOISTURE D2216							
Percent Moisture	32.3		0	0	wt%	R363298	1
Client Sample ID: D27 (0-1) 020618				**Lab ID:** 1802987-016			
Collection Date: 2/6/2018 3:41:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	135		1.98	7.81	mg/Kg-dry	255704	50
Copper	139		2.33	4.59	mg/Kg-dry	255704	50
Lead	3740		1.32	2.30	mg/Kg-dry	255704	50
Zinc	186		2.30	23.0	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.12		0.0099	0.042	mg/Kg-dry	255725	10
4,4´-DDT	0.059		0.0096	0.042	mg/Kg-dry	255725	10

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D27 (0-1) 020618				**Lab ID:** 1802987-016			
Collection Date: 2/6/2018 3:41:00 PM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	21.0		0	0	wt%	R363298	1
Client Sample ID: E26 (0-1) 020618				**Lab ID:** 1802987-017			
Collection Date: 2/6/2018 3:45:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	119		4.28	8.93	mg/Kg-dry	255704	100
Copper	39.4		5.04	9.92	mg/Kg-dry	255704	100
Lead	495		1.42	2.48	mg/Kg-dry	255704	50
Zinc	93.9		4.97	49.6	mg/Kg-dry	255704	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.057		0.0086	0.045	mg/Kg-dry	255725	10
4,4´-DDE	0.19		0.010	0.045	mg/Kg-dry	255725	10
4,4´-DDT	0.62		0.010	0.045	mg/Kg-dry	255725	10
PERCENT MOISTURE D2216							
Percent Moisture	25.3		0	0	wt%	R363298	1
Client Sample ID: C29 (0-1) 020618				**Lab ID:** 1802987-018			
Collection Date: 2/6/2018 3:47:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	25.5		2.33	4.59	mg/Kg-dry	255704	50
Lead	122		1.32	2.30	mg/Kg-dry	255704	50
Zinc	126		2.30	23.0	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.012		0.00098	0.0043	mg/Kg-dry	255725	1
PERCENT MOISTURE D2216							
Percent Moisture	22.7		0	0	wt%	R363298	1
Client Sample ID: D28 (0-1) 020618				**Lab ID:** 1802987-019			
Collection Date: 2/6/2018 3:55:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	277		2.16	7.52	mg/Kg-dry	255704	50
Copper	121		2.55	5.01	mg/Kg-dry	255704	50
Lead	65600		5.75	10.0	mg/Kg-dry	255704	200
Zinc	189		2.51	25.1	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.30		0.011	0.047	mg/Kg-dry	255725	10
4,4´-DDT	0.14		0.011	0.047	mg/Kg-dry	255725	10
PERCENT MOISTURE D2216							
Percent Moisture	29.2		0	0	wt%	R363298	1
Client Sample ID: E25 (0-1) 020618				**Lab ID:** 1802987-020			
Collection Date: 2/6/2018 4:05:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	386		2.12	7.88	mg/Kg-dry	255704	50
Copper	332		2.50	4.92	mg/Kg-dry	255704	50
Lead	13400		2.82	4.92	mg/Kg-dry	255704	100

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E25 (0-1) 020618				**Lab ID:** 1802987-020			
Collection Date: 2/6/2018 4:05:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Zinc	702		2.46	24.6	mg/Kg-dry	255704	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	22		0.88	4.5	mg/Kg-dry	255725	1000
4,4´-DDT	1100		10	45	mg/Kg-dry	255725	10000
PERCENT MOISTURE D2216							
Percent Moisture	26.6		0	0	wt%	R363298	1
Client Sample ID: D29 (0-1) 020618				**Lab ID:** 1802987-021			
Collection Date: 2/6/2018 4:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	22.1		1.18	11.6	mg/Kg-dry	255705	200
Lead	51.4		6.67	11.6	mg/Kg-dry	255705	200
Zinc	144		11.6	116	mg/Kg-dry	255705	200
PERCENT MOISTURE D2216							
Percent Moisture	28.4		0	0	wt%	R363298	1
Client Sample ID: C28 (0-1) 020618				**Lab ID:** 1802987-022			
Collection Date: 2/6/2018 4:16:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	170		8.00	16.7	mg/Kg-dry	255705	200
Copper	109		9.43	18.6	mg/Kg-dry	255705	200
Lead	499		5.32	9.28	mg/Kg-dry	255705	200
Zinc	391		9.28	92.8	mg/Kg-dry	255705	200
PERCENT MOISTURE D2216							
Percent Moisture	23.2		0	0	wt%	R363298	1
Client Sample ID: C27 (0-1) 020618				**Lab ID:** 1802987-023			
Collection Date: 2/6/2018 4:41:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	449		11.1	38.7	mg/Kg-dry	255705	200
Copper	750		13.1	25.8	mg/Kg-dry	255705	200
Lead	2130		7.41	12.9	mg/Kg-dry	255705	200
Zinc	1490		12.9	129	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.52		0.071	0.30	mg/Kg-dry	255746	50
4,4´-DDT	0.38		0.069	0.30	mg/Kg-dry	255746	50
PERCENT MOISTURE D2216							
Percent Moisture	45.1		0	0	wt%	R363298	1
Client Sample ID: D26 (0-1) 020818				**Lab ID:** 1802987-024			
Collection Date: 2/8/2018 10:38:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	1140		9.56	33.3	mg/Kg-dry	255705	200
Copper	141		11.3	22.2	mg/Kg-dry	255705	200
Lead	8170		6.36	11.1	mg/Kg-dry	255705	200
Zinc	210		11.1	111	mg/Kg-dry	255705	200

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D26 (0-1) 020818				**Lab ID:** 1802987-024			
Collection Date: 2/8/2018 10:38:00 AM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.060		0.0059	0.025	mg/Kg-dry	255746	5
4,4´-DDT	0.050		0.0057	0.025	mg/Kg-dry	255746	5
PERCENT MOISTURE D2216							
Percent Moisture	33.7		0	0	wt%	R363298	1
Client Sample ID: D25 (0-1) 020818				**Lab ID:** 1802987-025			
Collection Date: 2/8/2018 10:49:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	77.1		9.71	19.1	mg/Kg-dry	255705	200
Lead	131		5.48	9.55	mg/Kg-dry	255705	200
Zinc	415		9.56	95.5	mg/Kg-dry	255705	200
PERCENT MOISTURE D2216							
Percent Moisture	24.3		0	0	wt%	R363298	1
Client Sample ID: C26 (0-1) 020818				**Lab ID:** 1802987-026			
Collection Date: 2/8/2018 10:52:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	247		8.76	30.5	mg/Kg-dry	255705	200
Copper	522		10.3	20.3	mg/Kg-dry	255705	200
Lead	1530		5.83	10.2	mg/Kg-dry	255705	200
Zinc	1320		10.2	102	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.18		0.0055	0.023	mg/Kg-dry	255746	5
4,4´-DDT	0.043		0.0053	0.023	mg/Kg-dry	255746	5
PERCENT MOISTURE D2216							
Percent Moisture	28.6		0	0	wt%	R363298	1
Client Sample ID: E24 (0-1) 020818				**Lab ID:** 1802987-027			
Collection Date: 2/8/2018 11:00:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	56.7		9.48	33.0	mg/Kg-dry	255705	200
Copper	88.5		11.2	22.0	mg/Kg-dry	255705	200
Lead	911		6.31	11.0	mg/Kg-dry	255705	200
Zinc	605		11.0	110	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.73		0.094	0.49	mg/Kg-dry	255746	100
4,4´-DDE	1.6		0.11	0.49	mg/Kg-dry	255746	100
4,4´-DDT	3.1		0.11	0.49	mg/Kg-dry	255746	100
PERCENT MOISTURE D2216							
Percent Moisture	31.5		0	0	wt%	R363298	1
Client Sample ID: D24 (0-1) 020818				**Lab ID:** 1802987-028			
Collection Date: 2/8/2018 11:02:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	106		9.65	33.6	mg/Kg-dry	255705	200
Copper	308		11.4	22.4	mg/Kg-dry	255705	200

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D24 (0-1) 020818				**Lab ID:** 1802987-028			
Collection Date: 2/8/2018 11:02:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Lead	708		6.42	11.2	mg/Kg-dry	255705	200
Zinc	358		11.2	112	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.012		0.0024	0.010	mg/Kg-dry	255746	2
PERCENT MOISTURE D2216							
Percent Moisture	36.2		0	0	wt%	R363298	1
Client Sample ID: C25 (0-1) 020818				**Lab ID:** 1802987-029			
Collection Date: 2/8/2018 11:06:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	288		8.32	29.0	mg/Kg-dry	255705	200
Copper	114		9.81	19.3	mg/Kg-dry	255705	200
Lead	153		5.53	9.65	mg/Kg-dry	255705	200
PERCENT MOISTURE D2216							
Percent Moisture	25.7		0	0	wt%	R363298	1
Client Sample ID: D23 (0-1) 020818				**Lab ID:** 1802987-030			
Collection Date: 2/8/2018 11:18:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	118		10.1	19.9	mg/Kg-dry	255705	200
Lead	180		5.71	9.97	mg/Kg-dry	255705	200
Zinc	901		9.97	99.7	mg/Kg-dry	255705	200
PERCENT MOISTURE D2216							
Percent Moisture	27.8		0	0	wt%	R363298	1
Client Sample ID: E23 (0-1) 020818				**Lab ID:** 1802987-031			
Collection Date: 2/8/2018 11:20:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	16.9		8.93	10.4	mg/Kg-dry	255705	200
Copper	60.2		10.5	20.7	mg/Kg-dry	255705	200
Lead	1020		5.94	10.4	mg/Kg-dry	255705	200
Zinc	1000		10.4	104	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.51		0.11	0.48	mg/Kg-dry	255746	100
PERCENT MOISTURE D2216							
Percent Moisture	29.9		0	0	wt%	R363298	1
Client Sample ID: C24 (0-1) 020818				**Lab ID:** 1802987-032			
Collection Date: 2/8/2018 11:25:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	44.1		11.2	22.1	mg/Kg-dry	255705	200
Lead	22.6		6.34	11.1	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.075		0.0011	0.0048	mg/Kg-dry	255746	1
PERCENT MOISTURE D2216							
Percent Moisture	30.1		0	0	wt%	R363298	1

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D22 (0-1) 020818				**Lab ID:** 1802987-033			
Collection Date: 2/8/2018 11:34:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	188		8.24	28.7	mg/Kg-dry	255705	200
Copper	606		9.71	19.1	mg/Kg-dry	255705	200
Lead	2550		5.48	9.55	mg/Kg-dry	255705	200
Zinc	919		9.56	95.5	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.88		0.017	0.087	mg/Kg-dry	255746	20
4,4´-DDE	1.0		0.021	0.087	mg/Kg-dry	255746	20
4,4´-DDT	19		0.20	0.87	mg/Kg-dry	255746	200
alpha-BHC	0.14		0.021	0.044	mg/Kg-dry	255746	20
alpha-Chlordane	0.18		0.019	0.044	mg/Kg-dry	255746	20
beta-BHC	0.59		0.014	0.044	mg/Kg-dry	255746	20
delta-BHC	0.061		0.017	0.044	mg/Kg-dry	255746	20
Dieldrin	0.90		0.018	0.087	mg/Kg-dry	255746	20
gamma-BHC	0.064		0.016	0.044	mg/Kg-dry	255746	20
gamma-Chlordane	0.84		0.018	0.044	mg/Kg-dry	255746	20
Heptachlor	0.40		0.019	0.044	mg/Kg-dry	255746	20
PERCENT MOISTURE D2216							
Percent Moisture	23.9		0	0	wt%	R363298	1
Client Sample ID: C23 (0-1) 020818				**Lab ID:** 1802987-034			
Collection Date: 2/8/2018 11:44:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	327		8.54	29.7	mg/Kg-dry	255705	200
Copper	254		10.1	19.8	mg/Kg-dry	255705	200
Lead	1210		5.68	9.91	mg/Kg-dry	255705	200
Zinc	201		9.91	99.1	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.058		0.011	0.046	mg/Kg-dry	255746	10
PERCENT MOISTURE D2216							
Percent Moisture	28.2		0	0	wt%	R363298	1
Client Sample ID: B22 (0-1) 020818				**Lab ID:** 1802987-035			
Collection Date: 2/8/2018 12:25:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	74.8		8.78	30.6	mg/Kg-dry	255705	200
Copper	161		10.4	20.4	mg/Kg-dry	255705	200
Lead	486		5.84	10.2	mg/Kg-dry	255705	200
Zinc	309		10.2	102	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.078		0.0021	0.0090	mg/Kg-dry	255746	2
4,4´-DDT	0.091		0.0020	0.0090	mg/Kg-dry	255746	2
PERCENT MOISTURE D2216							
Percent Moisture	25.7		0	0	wt%	R363298	1
Client Sample ID: B23 (0-1) 020818				**Lab ID:** 1802987-036			
Collection Date: 2/8/2018 12:50:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: B23 (0-1) 020818				**Lab ID:** 1802987-036			
Collection Date: 2/8/2018 12:50:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	23.5		9.24	21.4	mg/Kg-dry	255705	200
Copper	99.1		10.9	21.4	mg/Kg-dry	255705	200
Lead	300		6.14	10.7	mg/Kg-dry	255705	200
Zinc	460		10.7	107	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	1.1		0.020	0.10	mg/Kg-dry	255746	20
4,4´-DDE	1.2		0.024	0.10	mg/Kg-dry	255746	20
4,4´-DDT	16		0.23	1.0	mg/Kg-dry	255746	200
alpha-BHC	0.061		0.024	0.051	mg/Kg-dry	255746	20
alpha-Chlordane	0.22		0.022	0.051	mg/Kg-dry	255746	20
beta-BHC	0.055		0.016	0.051	mg/Kg-dry	255746	20
Dieldrin	0.35		0.021	0.10	mg/Kg-dry	255746	20
gamma-Chlordane	0.46		0.021	0.051	mg/Kg-dry	255746	20
PERCENT MOISTURE D2216							
Percent Moisture	34.4		0	0	wt%	R363298	1
Client Sample ID: B24 (0-1) 020818				**Lab ID:** 1802987-037			
Collection Date: 2/8/2018 1:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	11.3		8.69	10.1	mg/Kg-dry	255705	200
Copper	66.0		10.2	20.1	mg/Kg-dry	255705	200
Lead	126		5.78	10.1	mg/Kg-dry	255705	200
Zinc	146		10.1	101	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.078		0.0018	0.0094	mg/Kg-dry	255746	2
4,4´-DDE	0.99		0.055	0.24	mg/Kg-dry	255746	50
4,4´-DDT	1.0		0.054	0.24	mg/Kg-dry	255746	50
alpha-Chlordane	0.0087		0.0020	0.0047	mg/Kg-dry	255746	2
Dieldrin	0.016		0.0020	0.0094	mg/Kg-dry	255746	2
Toxaphene	0.49		0.023	0.47	mg/Kg-dry	255746	2
PERCENT MOISTURE D2216							
Percent Moisture	29.5		0	0	wt%	R363298	1
Client Sample ID: D21 (0-1) 020818				**Lab ID:** 1802987-038			
Collection Date: 2/8/2018 1:34:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	90.5		7.86	27.4	mg/Kg-dry	255705	200
Copper	143		9.27	18.2	mg/Kg-dry	255705	200
Lead	503		5.23	9.12	mg/Kg-dry	255705	200
Zinc	521		9.12	91.2	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.69		0.041	0.21	mg/Kg-dry	255746	50
4,4´-DDE	1.0		0.049	0.21	mg/Kg-dry	255746	50
4,4´-DDT	9.5		0.48	2.1	mg/Kg-dry	255746	500
alpha-BHC	0.12		0.050	0.11	mg/Kg-dry	255746	50
alpha-Chlordane	0.51		0.045	0.11	mg/Kg-dry	255746	50

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D21 (0-1) 020818				**Lab ID:** 1802987-038			
Collection Date: 2/8/2018 1:34:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
beta-BHC	0.93		0.034	0.11	mg/Kg-dry	255746	50
Dieldrin	1.3		0.044	0.21	mg/Kg-dry	255746	50
gamma-Chlordane	0.91		0.043	0.11	mg/Kg-dry	255746	50
Heptachlor	0.13		0.046	0.11	mg/Kg-dry	255746	50
PERCENT MOISTURE D2216							
Percent Moisture	20.8		0	0	wt%	R363298	1
Client Sample ID: B25 (0-1) 020818				**Lab ID:** 1802987-039			
Collection Date: 2/8/2018 1:35:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	62.0		11.4	39.8	mg/Kg-dry	255705	200
Copper	117		13.5	26.5	mg/Kg-dry	255705	200
Lead	257		7.61	13.3	mg/Kg-dry	255705	200
Zinc	506		13.3	133	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.42		0.0068	0.029	mg/Kg-dry	255746	5
4,4´-DDT	0.38		0.0066	0.029	mg/Kg-dry	255746	5
PERCENT MOISTURE D2216							
Percent Moisture	42.5		0	0	wt%	R363298	1
Client Sample ID: D20 (0-1) 020818				**Lab ID:** 1802987-040			
Collection Date: 2/8/2018 1:46:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	176		8.89	30.9	mg/Kg-dry	255705	200
Copper	488		10.5	20.6	mg/Kg-dry	255705	200
Lead	1350		5.91	10.3	mg/Kg-dry	255705	200
Zinc	960		10.3	103	mg/Kg-dry	255705	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.79		0.091	0.47	mg/Kg-dry	255746	100
4,4´-DDE	1.3		0.11	0.47	mg/Kg-dry	255746	100
4,4´-DDT	19		1.1	4.7	mg/Kg-dry	255746	1000
alpha-Chlordane	1.3		0.10	0.24	mg/Kg-dry	255746	100
beta-BHC	0.29		0.076	0.24	mg/Kg-dry	255746	100
Dieldrin	1.1		0.099	0.47	mg/Kg-dry	255746	100
gamma-Chlordane	1.6		0.096	0.24	mg/Kg-dry	255746	100
PERCENT MOISTURE D2216							
Percent Moisture	29.5		0	0	wt%	R363298	1
Client Sample ID: C22 (0-1) 020818				**Lab ID:** 1802987-041			
Collection Date: 2/8/2018 1:57:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	102		1.83	31.8	mg/Kg-dry	255713	50
Copper	351		2.15	4.24	mg/Kg-dry	255713	50
Lead	1320		1.22	2.12	mg/Kg-dry	255713	50
Zinc	559		2.12	21.2	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C22 (0-1) 020818				**Lab ID:** 1802987-041			
Collection Date: 2/8/2018 1:57:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.095		0.018	0.091	mg/Kg-dry	255791	20
4,4´-DDE	0.33		0.021	0.091	mg/Kg-dry	255791	20
4,4´-DDT	2.6		0.021	0.091	mg/Kg-dry	255791	20
beta-BHC	0.063		0.015	0.046	mg/Kg-dry	255791	20
Dieldrin	0.26		0.019	0.091	mg/Kg-dry	255791	20
gamma-Chlordane	0.094		0.019	0.046	mg/Kg-dry	255791	20
PERCENT MOISTURE D2216							
Percent Moisture	27.1		0	0	wt%	R363298	1
Client Sample ID: D19 (0-1) 020818				**Lab ID:** 1802987-042			
Collection Date: 2/8/2018 2:02:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	41.9		1.94	9.00	mg/Kg-dry	255713	50
Copper	118		2.29	4.50	mg/Kg-dry	255713	50
Lead	59.7		1.29	2.25	mg/Kg-dry	255713	50
Zinc	220		2.25	22.5	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	14		0.99	4.4	mg/Kg-dry	255791	1000
alpha-Chlordane	3.9		0.93	2.2	mg/Kg-dry	255791	1000
gamma-Chlordane	4.2		0.88	2.2	mg/Kg-dry	255791	1000
PERCENT MOISTURE D2216							
Percent Moisture	23.5		0	0	wt%	R363298	1
Client Sample ID: B26 (0-1) 020818				**Lab ID:** 1802987-043			
Collection Date: 2/8/2018 2:05:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	48.1		2.92	5.74	mg/Kg-dry	255713	50
Lead	71.1		1.64	2.87	mg/Kg-dry	255713	50
Zinc	101		2.87	28.7	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.011		0.0020	0.0087	mg/Kg-dry	255791	2
PERCENT MOISTURE D2216							
Percent Moisture	23.2		0	0	wt%	R363298	1
Client Sample ID: C21 (0-1) 020818				**Lab ID:** 1802987-044			
Collection Date: 2/8/2018 2:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	36.5		2.33	10.8	mg/Kg-dry	255713	50
Copper	151		2.75	5.41	mg/Kg-dry	255713	50
Lead	1340		1.55	2.70	mg/Kg-dry	255713	50
Zinc	166		2.71	27.0	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.055		0.0010	0.0043	mg/Kg-dry	255791	1
4,4´-DDT	0.15		0.0099	0.043	mg/Kg-dry	255791	10
alpha-Chlordane	0.0055		0.00093	0.0022	mg/Kg-dry	255791	1
beta-BHC	0.021		0.00070	0.0022	mg/Kg-dry	255791	1

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C21 (0-1) 020818				**Lab ID:** 1802987-044			
Collection Date: 2/8/2018 2:10:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
Dieldrin	0.055		0.00091	0.0043	mg/Kg-dry	255791	1
gamma-Chlordane	0.019		0.00088	0.0022	mg/Kg-dry	255791	1
Toxaphene	0.25		0.011	0.22	mg/Kg-dry	255791	1
PERCENT MOISTURE D2216							
Percent Moisture	23.3		0	0	wt%	R363298	1
Client Sample ID: C20 (0-1) 020818				**Lab ID:** 1802987-045			
Collection Date: 2/8/2018 2:25:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	105		2.86	13.3	mg/Kg-dry	255713	50
Copper	460		3.38	6.64	mg/Kg-dry	255713	50
Lead	1330		1.90	3.32	mg/Kg-dry	255713	50
Zinc	784		3.32	33.2	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	27		1.9	9.9	mg/Kg-dry	255791	2000
4,4´-DDE	25		2.3	9.9	mg/Kg-dry	255791	2000
4,4´-DDT	1600		22	99	mg/Kg-dry	255791	20000
alpha-Chlordane	23		2.1	4.9	mg/Kg-dry	255791	2000
beta-BHC	56		1.6	4.9	mg/Kg-dry	255791	2000
Dieldrin	29		2.1	9.9	mg/Kg-dry	255791	2000
gamma-Chlordane	69		2.0	4.9	mg/Kg-dry	255791	2000
Heptachlor	41		2.2	4.9	mg/Kg-dry	255791	2000
PERCENT MOISTURE D2216							
Percent Moisture	32.5		0	0	wt%	R363298	1
Client Sample ID: D18 (0-1) 020818				**Lab ID:** 1802987-046			
Collection Date: 2/8/2018 2:28:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	312		2.05	9.50	mg/Kg-dry	255713	50
Copper	526		2.41	4.75	mg/Kg-dry	255713	50
Lead	3600		1.36	2.38	mg/Kg-dry	255713	50
Zinc	599		2.38	23.8	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	2.3		0.10	0.43	mg/Kg-dry	255791	100
alpha-BHC	0.61		0.10	0.21	mg/Kg-dry	255791	100
alpha-Chlordane	3.2		0.091	0.21	mg/Kg-dry	255791	100
beta-BHC	4.5		0.069	0.21	mg/Kg-dry	255791	100
Dieldrin	8.9		0.090	0.43	mg/Kg-dry	255791	100
gamma-BHC	0.44		0.077	0.21	mg/Kg-dry	255791	100
gamma-Chlordane	4.4		0.087	0.21	mg/Kg-dry	255791	100
Heptachlor	2.8		0.094	0.21	mg/Kg-dry	255791	100
PERCENT MOISTURE D2216							
Percent Moisture	22.2		0	0	wt%	R363298	1
Client Sample ID: B27 (0-1) 020818				**Lab ID:** 1802987-047			
Collection Date: 2/8/2018 2:35:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: B27 (0-1) 020818				**Lab ID:** 1802987-047			
Collection Date: 2/8/2018 2:35:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	8.03		4.18	7.46	mg/Kg-dry	255713	50
Copper	44.5		4.92	9.69	mg/Kg-dry	255713	50
Lead	1030		2.78	4.84	mg/Kg-dry	255713	50
Zinc	173		4.85	48.4	mg/Kg-dry	255713	50
PERCENT MOISTURE D2216							
Percent Moisture	60.3		0	0	wt%	R363298	1
Client Sample ID: C19 (0-1) 020818				**Lab ID:** 1802987-048			
Collection Date: 2/8/2018 2:46:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	23.7		2.51	4.94	mg/Kg-dry	255713	50
Lead	33.8		1.42	2.47	mg/Kg-dry	255713	50
Zinc	44.4		2.47	24.7	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.036		0.00095	0.0041	mg/Kg-dry	255791	1
4,4´-DDT	0.12		0.00092	0.0041	mg/Kg-dry	255791	1
alpha-Chlordane	0.042		0.00087	0.0020	mg/Kg-dry	255791	1
beta-BHC	0.0037		0.00065	0.0020	mg/Kg-dry	255791	1
gamma-Chlordane	0.063		0.00082	0.0020	mg/Kg-dry	255791	1
PERCENT MOISTURE D2216							
Percent Moisture	17.8		0	0	wt%	R363298	1
Client Sample ID: D16 (0-1) 020818				**Lab ID:** 1802987-049			
Collection Date: 2/8/2018 2:50:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	61.0		2.46	11.4	mg/Kg-dry	255713	50
Copper	239		2.90	5.70	mg/Kg-dry	255713	50
Lead	793		1.63	2.85	mg/Kg-dry	255713	50
Zinc	767		2.85	28.5	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	1.4		0.10	0.45	mg/Kg-dry	255791	100
PERCENT MOISTURE D2216							
Percent Moisture	26.1		0	0	wt%	R363298	1
Client Sample ID: C18 (0-1) 020818				**Lab ID:** 1802987-050			
Collection Date: 2/8/2018 3:03:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	6.98		1.93	3.79	mg/Kg-dry	255713	50
Lead	14.9		1.09	1.90	mg/Kg-dry	255713	50
Zinc	32.7		1.90	19.0	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.11		0.0017	0.0073	mg/Kg-dry	255791	2
4,4´-DDT	0.13		0.0016	0.0073	mg/Kg-dry	255791	2
alpha-Chlordane	0.012		0.0015	0.0036	mg/Kg-dry	255791	2
Dieldrin	0.018		0.0015	0.0073	mg/Kg-dry	255791	2
gamma-Chlordane	0.016		0.0015	0.0036	mg/Kg-dry	255791	2

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Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C18 (0-1) 020818				**Lab ID:** 1802987-050			
Collection Date: 2/8/2018 3:03:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
Toxaphene	0.74		0.018	0.36	mg/Kg-dry	255791	2
PERCENT MOISTURE D2216							
Percent Moisture	8.14		0	0	wt%	R363298	1
Client Sample ID: D15 (0-1) 020818				**Lab ID:** 1802987-051			
Collection Date: 2/8/2018 3:04:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	35.5		1.72	7.98	mg/Kg-dry	255713	50
Copper	94.3		2.03	3.99	mg/Kg-dry	255713	50
Lead	328		1.14	1.99	mg/Kg-dry	255713	50
Zinc	269		2.00	19.9	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.28		0.021	0.088	mg/Kg-dry	255791	20
4,4´-DDT	1.1		0.020	0.088	mg/Kg-dry	255791	20
PERCENT MOISTURE D2216							
Percent Moisture	24.1		0	0	wt%	R363298	1
Client Sample ID: B28 (0-1) 020818				**Lab ID:** 1802987-052			
Collection Date: 2/8/2018 3:05:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	65.9		2.74	12.7	mg/Kg-dry	255713	50
Copper	129		3.23	6.36	mg/Kg-dry	255713	50
Lead	273		1.82	3.18	mg/Kg-dry	255713	50
Zinc	677		3.18	31.8	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.036		0.0064	0.027	mg/Kg-dry	255791	5
4,4´-DDT	0.029		0.0062	0.027	mg/Kg-dry	255791	5
beta-BHC	0.016		0.0044	0.014	mg/Kg-dry	255791	5
PERCENT MOISTURE D2216							
Percent Moisture	38.7		0	0	wt%	R363298	1
Client Sample ID: C17 (0-1) 020818				**Lab ID:** 1802987-053			
Collection Date: 2/8/2018 3:21:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	34.6		2.66	12.3	mg/Kg-dry	255713	50
Copper	85.4		3.14	6.17	mg/Kg-dry	255713	50
Lead	217		1.77	3.09	mg/Kg-dry	255713	50
Zinc	215		3.09	30.9	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.79		0.10	0.44	mg/Kg-dry	255791	100
4,4´-DDT	4.9		0.099	0.44	mg/Kg-dry	255791	100
beta-BHC	0.84		0.070	0.22	mg/Kg-dry	255791	100
PERCENT MOISTURE D2216							
Percent Moisture	23.5		0	0	wt%	R363298	1
Client Sample ID: B29 (0-1) 020818				**Lab ID:** 1802987-054			
Collection Date: 2/8/2018 3:35:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	12.5		1.76	8.15	mg/Kg-dry	255713	50
Copper	55.8		2.07	4.08	mg/Kg-dry	255713	50
Lead	92.8		1.17	2.04	mg/Kg-dry	255713	50
Zinc	315		2.04	20.4	mg/Kg-dry	255713	50
PERCENT MOISTURE D2216							
Percent Moisture	21.6		0	0	wt%	R363298	1
Client Sample ID: C16 (0-1) 020818				**Lab ID:** 1802987-055			
Collection Date: 2/8/2018 3:40:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	32.6		1.88	3.70	mg/Kg-dry	255713	50
Lead	56.4		1.06	1.85	mg/Kg-dry	255713	50
Zinc	67.1		1.85	18.5	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.18		0.020	0.088	mg/Kg-dry	255791	20
PERCENT MOISTURE D2216							
Percent Moisture	24.2		0	0	wt%	R363298	1
Client Sample ID: C15 (0-1) 020818				**Lab ID:** 1802987-056			
Collection Date: 2/8/2018 3:56:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	25.1		5.74	11.3	mg/Kg-dry	255713	100
Lead	35.4		1.62	2.82	mg/Kg-dry	255713	50
Zinc	65.6		2.83	28.2	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.30		0.0054	0.024	mg/Kg-dry	255791	5
beta-BHC	0.021		0.0038	0.012	mg/Kg-dry	255791	5
gamma-Chlordane	0.021		0.0048	0.012	mg/Kg-dry	255791	5
Heptachlor	0.012		0.0052	0.012	mg/Kg-dry	255791	5
PERCENT MOISTURE D2216							
Percent Moisture	29.6		0	0	wt%	R363298	1
Client Sample ID: A22 (0-1) 020918				**Lab ID:** 1802987-057			
Collection Date: 2/9/2018 8:50:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	45.5		3.01	13.9	mg/Kg-dry	255713	50
Copper	120		3.54	6.97	mg/Kg-dry	255713	50
Lead	412		2.00	3.49	mg/Kg-dry	255713	50
Zinc	446		3.49	34.9	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.52		0.050	0.26	mg/Kg-dry	255791	50
4,4´-DDE	3.0		0.060	0.26	mg/Kg-dry	255791	50
4,4´-DDT	19		0.58	2.6	mg/Kg-dry	255791	500
Dieldrin	0.26		0.054	0.26	mg/Kg-dry	255791	50
PERCENT MOISTURE D2216							
Percent Moisture	35.2		0	0	wt%	R363298	1
Client Sample ID: D17 (0-1) 020918				**Lab ID:** 1802987-058			
Collection Date: 2/9/2018 9:00:00 AM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D17 (0-1) 020918				**Lab ID:** 1802987-058			
Collection Date: 2/9/2018 9:00:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	84.6		1.46	6.78	mg/Kg-dry	255713	50
Copper	86.7		1.72	3.39	mg/Kg-dry	255713	50
Lead	665		0.972	1.69	mg/Kg-dry	255713	50
Zinc	153		1.70	16.9	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	130		1.7	7.6	mg/Kg-dry	255791	2000
alpha-Chlordane	11		1.6	3.8	mg/Kg-dry	255791	2000
beta-BHC	31		1.2	3.8	mg/Kg-dry	255791	2000
Dieldrin	24		1.6	7.6	mg/Kg-dry	255791	2000
gamma-Chlordane	17		1.5	3.8	mg/Kg-dry	255791	2000
Heptachlor	21		1.7	3.8	mg/Kg-dry	255791	2000
PERCENT MOISTURE D2216							
Percent Moisture	11.8		0	0	wt%	R363298	1
Client Sample ID: A23 (0-1) 020918				**Lab ID:** 1802987-059			
Collection Date: 2/9/2018 9:15:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	14.0		3.03	10.5	mg/Kg-dry	255713	50
Copper	93.0		3.57	7.03	mg/Kg-dry	255713	50
Lead	98.5		2.02	3.52	mg/Kg-dry	255713	50
Zinc	134		3.52	35.2	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.070		0.012	0.049	mg/Kg-dry	255791	10
4,4´-DDT	0.12		0.011	0.049	mg/Kg-dry	255791	10
PERCENT MOISTURE D2216							
Percent Moisture	32.2		0	0	wt%	R363298	1
Client Sample ID: E22 (0-1) 020918				**Lab ID:** 1802987-060			
Collection Date: 2/9/2018 9:33:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	79.0		2.20	10.2	mg/Kg-dry	255713	50
Copper	383		2.59	5.10	mg/Kg-dry	255713	50
Lead	857		1.46	2.55	mg/Kg-dry	255713	50
Zinc	951		2.55	25.5	mg/Kg-dry	255713	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.94		0.049	0.25	mg/Kg-dry	255791	50
4,4´-DDE	0.54		0.059	0.25	mg/Kg-dry	255791	50
4,4´-DDT	11		0.58	2.5	mg/Kg-dry	255791	500
alpha-Chlordane	0.40		0.054	0.13	mg/Kg-dry	255791	50
beta-BHC	0.78		0.041	0.13	mg/Kg-dry	255791	50
delta-BHC	0.17		0.049	0.13	mg/Kg-dry	255791	50
Dieldrin	1.0		0.053	0.25	mg/Kg-dry	255791	50
gamma-BHC	0.15		0.045	0.13	mg/Kg-dry	255791	50
gamma-Chlordane	1.0		0.051	0.13	mg/Kg-dry	255791	50
PERCENT MOISTURE D2216							
Percent Moisture	34.3		0	0	wt%	R363298	1

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: A24 (0-1) 020918				**Lab ID:** 1802987-061			
Collection Date: 2/9/2018 9:40:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	18.4		2.36	8.19	mg/Kg-dry	255765	50
Copper	117		2.78	5.46	mg/Kg-dry	255765	50
Lead	180		1.57	2.73	mg/Kg-dry	255765	50
Zinc	524		2.73	27.3	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.051		0.0045	0.023	mg/Kg-dry	255896	5
4,4´-DDE	0.16		0.0055	0.023	mg/Kg-dry	255896	5
4,4´-DDT	2.1		0.053	0.23	mg/Kg-dry	255896	50
Toxaphene	1.4		0.057	1.2	mg/Kg-dry	255896	5
PERCENT MOISTURE D2216							
Percent Moisture	28.5		0	0	wt%	R363298	1
Client Sample ID: E21 (0-1) 020918				**Lab ID:** 1802987-062			
Collection Date: 2/9/2018 9:43:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	15.1		3.57	9.94	mg/Kg-dry	255765	100
Copper	629		4.21	8.28	mg/Kg-dry	255765	100
Lead	1540		2.37	4.14	mg/Kg-dry	255765	100
Zinc	733		4.14	41.4	mg/Kg-dry	255765	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.49		0.051	0.22	mg/Kg-dry	255896	50
4,4´-DDT	0.68		0.049	0.22	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	23.3		0	0	wt%	R363298	1
Client Sample ID: E20 (0-1) 020918				**Lab ID:** 1802987-063			
Collection Date: 2/9/2018 9:56:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	34.2		2.27	4.47	mg/Kg-dry	255765	50
Lead	92.7		2.56	4.47	mg/Kg-dry	255765	100
Zinc	141		4.47	44.7	mg/Kg-dry	255765	100
PERCENT MOISTURE D2216							
Percent Moisture	25.9		0	0	wt%	R363298	1
Client Sample ID: E19 (0-1) 020918				**Lab ID:** 1802987-064			
Collection Date: 2/9/2018 10:10:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	11.2		3.32	7.69	mg/Kg-dry	255765	100
Copper	36.9		1.95	3.85	mg/Kg-dry	255765	50
Lead	388		2.21	3.85	mg/Kg-dry	255765	100
Zinc	363		3.85	38.5	mg/Kg-dry	255765	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.67		0.099	0.42	mg/Kg-dry	255896	100
4,4´-DDT	0.87		0.096	0.42	mg/Kg-dry	255896	100
PERCENT MOISTURE D2216							
Percent Moisture	20.8		0	0	wt%	R363298	1

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: A25 (0-1) 020918				**Lab ID:** 1802987-065			
Collection Date: 2/9/2018 10:20:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	11.8		2.81	9.79	mg/Kg-dry	255765	50
Copper	87.4		3.32	6.53	mg/Kg-dry	255765	50
Lead	102		1.87	3.26	mg/Kg-dry	255765	50
Zinc	259		3.27	32.6	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.100		0.011	0.046	mg/Kg-dry	255896	10
4,4´-DDT	0.15		0.010	0.046	mg/Kg-dry	255896	10
PERCENT MOISTURE D2216							
Percent Moisture	27.2		0	0	wt%	R363298	1
Client Sample ID: E18 (0-1) 020918				**Lab ID:** 1802987-066			
Collection Date: 2/9/2018 10:22:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	7.67		2.14	7.44	mg/Kg-dry	255765	50
Copper	140		2.52	4.96	mg/Kg-dry	255765	50
Lead	718		1.42	2.48	mg/Kg-dry	255765	50
Zinc	767		2.48	24.8	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.66		0.11	0.47	mg/Kg-dry	255896	100
4,4´-DDT	2.0		0.11	0.47	mg/Kg-dry	255896	100
PERCENT MOISTURE D2216							
Percent Moisture	29.2		0	0	wt%	R363298	1
Client Sample ID: A26 (0-1) 020918				**Lab ID:** 1802987-067			
Collection Date: 2/9/2018 10:45:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	28.0		4.83	16.8	mg/Kg-dry	255765	50
Copper	62.3		5.69	11.2	mg/Kg-dry	255765	50
Lead	407		3.21	5.60	mg/Kg-dry	255765	50
Zinc	168		5.61	56.0	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.68		0.020	0.084	mg/Kg-dry	255896	10
4,4´-DDT	0.19		0.019	0.084	mg/Kg-dry	255896	10
PERCENT MOISTURE D2216							
Percent Moisture	60.6		0	0	wt%	R363298	1
Client Sample ID: D14 (0-1) 020918				**Lab ID:** 1802987-068			
Collection Date: 2/9/2018 11:30:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	65.3		2.76	9.61	mg/Kg-dry	255765	50
Copper	283		3.25	6.40	mg/Kg-dry	255765	50
Lead	990		1.84	3.20	mg/Kg-dry	255765	50
Zinc	1110		3.20	32.0	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.39		0.043	0.22	mg/Kg-dry	255896	50
4,4´-DDE	1.8		0.052	0.22	mg/Kg-dry	255896	50

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D14 (0-1) 020918				**Lab ID:** 1802987-068			
Collection Date: 2/9/2018 11:30:00 AM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	4.6		0.051	0.22	mg/Kg-dry	255896	50
alpha-Chlordane	0.25		0.048	0.11	mg/Kg-dry	255896	50
beta-BHC	0.13		0.036	0.11	mg/Kg-dry	255896	50
Dieldrin	1.3		0.047	0.22	mg/Kg-dry	255896	50
gamma-Chlordane	0.28		0.045	0.11	mg/Kg-dry	255896	50
Toxaphene	16		0.55	11	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	25.4		0	0	wt%	R363298	1
Client Sample ID: D13 (0-1) 020918				**Lab ID:** 1802987-069			
Collection Date: 2/9/2018 11:50:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	64.8		2.34	8.15	mg/Kg-dry	255765	50
Copper	327		2.76	5.44	mg/Kg-dry	255765	50
Lead	1110		1.56	2.72	mg/Kg-dry	255765	50
Zinc	971		2.72	27.2	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.22		0.040	0.21	mg/Kg-dry	255896	50
4,4´-DDE	1.2		0.048	0.21	mg/Kg-dry	255896	50
4,4´-DDT	2.6		0.047	0.21	mg/Kg-dry	255896	50
Dieldrin	0.47		0.043	0.21	mg/Kg-dry	255896	50
gamma-Chlordane	0.22		0.042	0.10	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	19.1		0	0	wt%	R363298	1
Client Sample ID: E17 (0-1) 020918				**Lab ID:** 1802987-070			
Collection Date: 2/9/2018 11:56:00 AM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	11.6		3.16	7.54	mg/Kg-dry	255765	100
Copper	215		1.86	3.66	mg/Kg-dry	255765	50
Lead	922		2.10	3.66	mg/Kg-dry	255765	100
Zinc	751		3.66	36.6	mg/Kg-dry	255765	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.62		0.096	0.41	mg/Kg-dry	255896	100
4,4´-DDT	2.8		0.093	0.41	mg/Kg-dry	255896	100
Dieldrin	0.53		0.086	0.41	mg/Kg-dry	255896	100
PERCENT MOISTURE D2216							
Percent Moisture	19.1		0	0	wt%	R363298	1
Client Sample ID: E16 (0-1) 020918				**Lab ID:** 1802987-071			
Collection Date: 2/9/2018 12:05:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	23.3		3.03	10.5	mg/Kg-dry	255765	50
Copper	97.7		3.57	7.02	mg/Kg-dry	255765	50
Lead	295		2.01	3.51	mg/Kg-dry	255765	50
Zinc	255		3.51	35.1	mg/Kg-dry	255765	50

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E16 (0-1) 020918				**Lab ID:** 1802987-071			
Collection Date: 2/9/2018 12:05:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.48		0.046	0.24	mg/Kg-dry	255896	50
4,4´-DDE	0.96		0.055	0.24	mg/Kg-dry	255896	50
4,4´-DDT	5.5		0.053	0.24	mg/Kg-dry	255896	50
alpha-Chlordane	0.46		0.050	0.12	mg/Kg-dry	255896	50
gamma-Chlordane	0.38		0.048	0.12	mg/Kg-dry	255896	50
Toxaphene	16		0.58	12	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	29.3		0	0	wt%	R363298	1
Client Sample ID: D12 (0-1) 020918				**Lab ID:** 1802987-072			
Collection Date: 2/9/2018 12:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	125		2.23	7.77	mg/Kg-dry	255765	50
Copper	457		2.63	5.18	mg/Kg-dry	255765	50
Lead	1720		1.49	2.59	mg/Kg-dry	255765	50
Zinc	1530		2.59	25.9	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	1.2		0.10	0.44	mg/Kg-dry	255896	100
4,4´-DDT	2.7		0.10	0.44	mg/Kg-dry	255896	100
PERCENT MOISTURE D2216							
Percent Moisture	24.5		0	0	wt%	R363298	1
Client Sample ID: E15 (0-1) 020918				**Lab ID:** 1802987-073			
Collection Date: 2/9/2018 12:27:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	66.4		2.68	9.33	mg/Kg-dry	255765	50
Copper	411		3.16	6.22	mg/Kg-dry	255765	50
Lead	590		1.78	3.11	mg/Kg-dry	255765	50
Zinc	4620		3.11	31.1	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.14		0.010	0.043	mg/Kg-dry	255896	10
4,4´-DDT	0.21		0.0098	0.043	mg/Kg-dry	255896	10
PERCENT MOISTURE D2216							
Percent Moisture	22.6		0	0	wt%	R363298	1
Client Sample ID: D10 (0-1) 020918				**Lab ID:** 1802987-074			
Collection Date: 2/9/2018 12:40:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	12.7		2.55	8.87	mg/Kg-dry	255765	50
Copper	54.1		3.00	5.91	mg/Kg-dry	255765	50
Lead	219		1.69	2.96	mg/Kg-dry	255765	50
Zinc	143		2.96	29.6	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	2.8		0.12	0.50	mg/Kg-dry	255896	100
4,4´-DDT	8.6		0.11	0.50	mg/Kg-dry	255896	100
PERCENT MOISTURE D2216							

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: D10 (0-1) 020918				**Lab ID:** 1802987-074			
Collection Date: 2/9/2018 12:40:00 PM				**Matrix:** Soil			
PERCENT MOISTURE D2216							
Percent Moisture	33.8		0	0	wt%	R363298	1
Client Sample ID: E14 (0-1) 020918				**Lab ID:** 1802987-075			
Collection Date: 2/9/2018 3:52:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	122		3.08	8.57	mg/Kg-dry	255765	100
Copper	907		3.63	7.14	mg/Kg-dry	255765	100
Lead	1060		2.05	3.57	mg/Kg-dry	255765	100
Zinc	933		3.57	35.7	mg/Kg-dry	255765	100
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.12		0.0100	0.043	mg/Kg-dry	255896	10
4,4´-DDT	0.14		0.0097	0.043	mg/Kg-dry	255896	10
alpha-BHC	0.025		0.010	0.021	mg/Kg-dry	255896	10
beta-BHC	0.025		0.0068	0.021	mg/Kg-dry	255896	10
PERCENT MOISTURE D2216							
Percent Moisture	21.9		0	0	wt%	R363298	1
Client Sample ID: E13 (0-1) 020918				**Lab ID:** 1802987-076			
Collection Date: 2/9/2018 1:04:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	331		2.40	8.36	mg/Kg-dry	255765	50
Copper	454		2.83	5.57	mg/Kg-dry	255765	50
Lead	2820		1.60	2.79	mg/Kg-dry	255765	50
Zinc	2050		2.79	27.9	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.52		0.053	0.23	mg/Kg-dry	255896	50
4,4´-DDT	0.68		0.051	0.23	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	26.5		0	0	wt%	R363298	1
Client Sample ID: D11 (0-1) 020918				**Lab ID:** 1802987-077			
Collection Date: 2/9/2018 1:10:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	31.5		2.03	4.00	mg/Kg-dry	255765	50
Lead	70.3		4.59	8.00	mg/Kg-dry	255765	200
Zinc	90.0		8.01	80.0	mg/Kg-dry	255765	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.83		0.0099	0.042	mg/Kg-dry	255896	10
4,4´-DDT	0.78		0.0096	0.042	mg/Kg-dry	255896	10
beta-BHC	0.041		0.0068	0.021	mg/Kg-dry	255896	10
Dieldrin	0.081		0.0088	0.042	mg/Kg-dry	255896	10
PERCENT MOISTURE D2216							
Percent Moisture	21.1		0	0	wt%	R363298	1
Client Sample ID: E12 (0-1) 020918				**Lab ID:** 1802987-078			
Collection Date: 2/9/2018 1:34:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: E12 (0-1) 020918				**Lab ID:** 1802987-078			
Collection Date: 2/9/2018 1:34:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	8.09		2.35	7.37	mg/Kg-dry	255765	50
Copper	146		2.77	5.46	mg/Kg-dry	255765	50
Lead	84.7		1.57	2.73	mg/Kg-dry	255765	50
Zinc	293		2.73	27.3	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.37		0.017	0.090	mg/Kg-dry	255896	20
4,4´-DDE	1.1		0.021	0.090	mg/Kg-dry	255896	20
4,4´-DDT	6.2		0.21	0.90	mg/Kg-dry	255896	200
alpha-Chlordane	1.2		0.019	0.045	mg/Kg-dry	255896	20
beta-BHC	1.7		0.15	0.45	mg/Kg-dry	255896	200
Dieldrin	0.77		0.019	0.090	mg/Kg-dry	255896	20
gamma-Chlordane	2.1		0.18	0.45	mg/Kg-dry	255896	200
Heptachlor	0.42		0.020	0.045	mg/Kg-dry	255896	20
PERCENT MOISTURE D2216							
Percent Moisture	26.4		0	0	wt%	R363298	1
Client Sample ID: B10 (0-1) 020918				**Lab ID:** 1802987-079			
Collection Date: 2/9/2018 1:40:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	15.1		2.96	5.83	mg/Kg-dry	255765	50
Lead	38.6		1.67	2.91	mg/Kg-dry	255765	50
Zinc	91.8		2.91	29.1	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.67		0.049	0.21	mg/Kg-dry	255896	50
4,4´-DDT	1.9		0.048	0.21	mg/Kg-dry	255896	50
beta-BHC	0.12		0.034	0.11	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	20.9		0	0	wt%	R363298	1
Client Sample ID: E11 (0-1) 020918				**Lab ID:** 1802987-080			
Collection Date: 2/9/2018 1:42:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	495		2.09	363	mg/Kg-dry	255765	50
Copper	2360		2.46	4.84	mg/Kg-dry	255765	50
Lead	4340		1.39	2.42	mg/Kg-dry	255765	50
Zinc	4730		2.42	24.2	mg/Kg-dry	255765	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.33		0.048	0.20	mg/Kg-dry	255896	50
4,4´-DDT	0.96		0.046	0.20	mg/Kg-dry	255896	50
beta-BHC	0.21		0.033	0.10	mg/Kg-dry	255896	50
Dieldrin	0.28		0.042	0.20	mg/Kg-dry	255896	50
gamma-Chlordane	0.16		0.041	0.10	mg/Kg-dry	255896	50
PERCENT MOISTURE D2216							
Percent Moisture	18.0		0	0	wt%	R363298	1
Client Sample ID: E10 (0-1) 020918				**Lab ID:** 1802987-081			
Collection Date: 2/9/2018 2:00:00 PM				**Matrix:** Soil			

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	257		2.51	8.72	mg/Kg-dry	255768	50
Copper	240		2.95	5.81	mg/Kg-dry	255768	50
Lead	1410		1.67	2.91	mg/Kg-dry	255768	50
Zinc	587		2.91	29.1	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	2.1		0.049	0.21	mg/Kg-dry	255820	50
4,4´-DDT	2.8		0.048	0.21	mg/Kg-dry	255820	50
beta-BHC	0.17		0.034	0.11	mg/Kg-dry	255820	50
Dieldrin	0.24		0.044	0.21	mg/Kg-dry	255820	50
gamma-Chlordane	0.12		0.043	0.11	mg/Kg-dry	255820	50
PERCENT MOISTURE D2216							
Percent Moisture	20.8		0	0	wt%	R363298	1
Client Sample ID: B11 (0-1) 020918				**Lab ID:** 1802987-082			
Collection Date: 2/9/2018 2:05:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	18.5		2.61	5.13	mg/Kg-dry	255768	50
Lead	38.1		1.47	2.57	mg/Kg-dry	255768	50
Zinc	84.0		2.57	25.7	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.24		0.019	0.079	mg/Kg-dry	255820	20
4,4´-DDT	1.1		0.018	0.079	mg/Kg-dry	255820	20
beta-BHC	0.11		0.013	0.040	mg/Kg-dry	255820	20
PERCENT MOISTURE D2216							
Percent Moisture	16.0		0	0	wt%	R363298	1
Client Sample ID: E9 (0-1) 020918				**Lab ID:** 1802987-083			
Collection Date: 2/9/2018 2:20:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	348		2.25	7.84	mg/Kg-dry	255768	50
Copper	478		2.66	5.22	mg/Kg-dry	255768	50
Lead	2470		1.50	2.61	mg/Kg-dry	255768	50
Zinc	788		2.61	26.1	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.99		0.096	0.42	mg/Kg-dry	255820	100
PERCENT MOISTURE D2216							
Percent Moisture	21.4		0	0	wt%	R363298	1
Client Sample ID: C14 (0-1) 020918				**Lab ID:** 1802987-084			
Collection Date: 2/9/2018 2:23:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	41.2		7.97	27.7	mg/Kg-dry	255768	200
Copper	43.9		9.39	18.5	mg/Kg-dry	255768	200
Lead	126		1.32	2.31	mg/Kg-dry	255768	50
Zinc	128		9.25	92.4	mg/Kg-dry	255768	200
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.093		0.0100	0.043	mg/Kg-dry	255820	10
4,4´-DDT	0.27		0.0097	0.043	mg/Kg-dry	255820	10

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C14 (0-1) 020918				**Lab ID:** 1802987-084			
Collection Date: 2/9/2018 2:23:00 PM				**Matrix:** Soil			
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
Dieldrin	0.055		0.0089	0.043	mg/Kg-dry	255820	10
PERCENT MOISTURE D2216							
Percent Moisture	21.8		0	0	wt%	R363298	1
Client Sample ID: B12 (0-1) 020918				**Lab ID:** 1802987-085			
Collection Date: 2/9/2018 2:35:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	24.3		2.29	7.96	mg/Kg-dry	255768	50
Copper	43.9		2.70	5.31	mg/Kg-dry	255768	50
Lead	204		1.52	2.65	mg/Kg-dry	255768	50
Zinc	134		2.66	26.5	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.092		0.020	0.084	mg/Kg-dry	255820	20
4,4´-DDT	0.14		0.019	0.084	mg/Kg-dry	255820	20
PERCENT MOISTURE D2216							
Percent Moisture	20.5		0	0	wt%	R363298	1
Client Sample ID: C13 (0-1) 020918				**Lab ID:** 1802987-086			
Collection Date: 2/9/2018 2:48:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	17.2		2.21	7.67	mg/Kg-dry	255768	50
Copper	16.4		2.60	5.12	mg/Kg-dry	255768	50
Lead	65.7		1.47	2.56	mg/Kg-dry	255768	50
Zinc	49.7		2.56	25.6	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDT	0.069		0.0099	0.044	mg/Kg-dry	255820	10
PERCENT MOISTURE D2216							
Percent Moisture	23.5		0	0	wt%	R363298	1
Client Sample ID: C12 (0-1) 020918				**Lab ID:** 1802987-087			
Collection Date: 2/9/2018 3:14:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	16.9		2.76	5.43	mg/Kg-dry	255768	50
Lead	57.2		1.56	2.71	mg/Kg-dry	255768	50
Zinc	79.9		2.71	27.1	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.098		0.0047	0.020	mg/Kg-dry	255820	5
4,4´-DDT	0.20		0.0046	0.020	mg/Kg-dry	255820	5
Dieldrin	0.032		0.0042	0.020	mg/Kg-dry	255820	5
PERCENT MOISTURE D2216							
Percent Moisture	17.1		0	0	wt%	R363298	1
Client Sample ID: C11 (0-1) 020918				**Lab ID:** 1802987-088			
Collection Date: 2/9/2018 3:39:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Copper	13.3		2.33	4.59	mg/Kg-dry	255768	50

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SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: C11 (0-1) 020918				**Lab ID:** 1802987-088			
Collection Date: 2/9/2018 3:39:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Lead	37.9		1.32	2.30	mg/Kg-dry	255768	50
Zinc	61.8		2.30	23.0	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDE	0.11		0.0090	0.038	mg/Kg-dry	255820	10
4,4´-DDT	0.19		0.0087	0.038	mg/Kg-dry	255820	10
PERCENT MOISTURE D2216							
Percent Moisture	13.4		0	0	wt%	R363298	1
Client Sample ID: C8 (0-1) 020918				**Lab ID:** 1802987-089			
Collection Date: 2/9/2018 4:42:00 PM				**Matrix:** Soil			
Metals by ICP/MS SW6020B				**(SW3050B)**			
Arsenic	102		2.13	37.1	mg/Kg-dry	255768	50
Copper	268		2.51	4.94	mg/Kg-dry	255768	50
Lead	1510		1.42	2.47	mg/Kg-dry	255768	50
Zinc	893		2.47	24.7	mg/Kg-dry	255768	50
CHLORINATED PESTICIDES, TCL SW8081B				**(SW3550C)**			
4,4´-DDD	0.36		0.017	0.085	mg/Kg-dry	255820	20
4,4´-DDE	1.6		0.020	0.085	mg/Kg-dry	255820	20
4,4´-DDT	16		0.19	0.85	mg/Kg-dry	255820	200
alpha-BHC	0.080		0.020	0.043	mg/Kg-dry	255820	20
alpha-Chlordane	0.20		0.018	0.043	mg/Kg-dry	255820	20
beta-BHC	1.3		0.014	0.043	mg/Kg-dry	255820	20
delta-BHC	0.057		0.016	0.043	mg/Kg-dry	255820	20
Dieldrin	0.63		0.018	0.085	mg/Kg-dry	255820	20
gamma-BHC	0.060		0.015	0.043	mg/Kg-dry	255820	20
gamma-Chlordane	0.61		0.017	0.043	mg/Kg-dry	255820	20
PERCENT MOISTURE D2216							
Percent Moisture	22.0		0	0	wt%	R363298	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **AMEC Foster Wheeler** AES Work Order Number: **1802E95**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.6 °C Cooler 2 Temperature 0.1 °C Cooler 3 Temperature 0.6 °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 2/15/18

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). TR 2/16/18

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). TR 2/16/18

Checklist 6.9.17 Rev 2

Locked

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255704

Sample ID: **MB-255704**	Client ID:					Units: **ug/Kg**		Prep Date: **02/12/2018**		Run No: **363284**	
SampleType: **MBLK**	TestCode: **Metals by ICP/MS SW6020B**					BatchID: **255704**		Analysis Date: **02/16/2018**		Seq No: **8027614**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-255704**	Client ID:					Units: **ug/Kg**		Prep Date: **02/12/2018**		Run No: **363284**	
SampleType: **LCS**	TestCode: **Metals by ICP/MS SW6020B**					BatchID: **255704**		Analysis Date: **02/16/2018**		Seq No: **8027616**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	5893	5500	5000	53.33	117	80	120				
Copper	5586	100	5000		112	80	120				
Lead	5230	50.0	5000	33.09	104	80	120				
Zinc	5525	500	5000		110	80	120				

Sample ID: **1802987-001AMS**	Client ID: **C32 (0-1) 020618**					Units: **mg/Kg-dry**		Prep Date: **02/12/2018**		Run No: **363284**	
SampleType: **MS**	TestCode: **Metals by ICP/MS SW6020B**					BatchID: **255704**		Analysis Date: **02/16/2018**		Seq No: **8027624**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	60.29	46.1	6.151	68.46	-133	75	125				S
Copper	70.08	6.15	6.151	51.99	294	75	125				S
Lead	1236	3.08	6.151	996.5	3890	75	125				S
Zinc	343.9	30.8	6.151	189.2	2520	75	125				S

Sample ID: **1802987-001AMSD**	Client ID: **C32 (0-1) 020618**					Units: **mg/Kg-dry**		Prep Date: **02/12/2018**		Run No: **363284**	
SampleType: **MSD**	TestCode: **Metals by ICP/MS SW6020B**					BatchID: **255704**		Analysis Date: **02/16/2018**		Seq No: **8027625**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	63.99	46.0	6.133	68.46	-72.9	75	125	60.29	5.96	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255704

Sample ID: **1802987-001AMSD** Client ID: **C32 (0-1) 020618** Units: **mg/Kg-dry** Prep Date: **02/12/2018** Run No: **363284**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255704** Analysis Date: **02/16/2018** Seq No: **8027625**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	62.85	6.13	6.133	51.99	177	75	125	70.08	10.9	20	S
Lead	1092	3.07	6.133	996.5	1550	75	125	1236	12.4	20	S
Zinc	239.9	30.7	6.133	189.2	827	75	125	343.9	35.6	20	SR

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255705

Sample ID: **MB-255705**	Client ID:				Units: **ug/Kg**		Prep Date: **02/13/2018**		Run No: **363513**	
SampleType: **MBLK**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255705**		Analysis Date: **02/20/2018**		Seq No: **8031656**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-255705**	Client ID:				Units: **ug/Kg**		Prep Date: **02/13/2018**		Run No: **363513**	
SampleType: **LCS**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255705**		Analysis Date: **02/20/2018**		Seq No: **8031657**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	5941	100	5000		119	80	120				
Lead	5325	50.0	5000		107	80	120				
Zinc	5828	500	5000		117	80	120				

Sample ID: **LCS-255705**	Client ID:				Units: **ug/Kg**		Prep Date: **02/13/2018**		Run No: **363513**	
SampleType: **LCS**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255705**		Analysis Date: **02/21/2018**		Seq No: **8032966**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	4287	4200	5000	143.4	82.9	80	120				

Sample ID: **1802987-032AMS**	Client ID: **C24 (0-1) 020818**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363513**	
SampleType: **MS**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255705**		Analysis Date: **02/20/2018**		Seq No: **8031659**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	13.82	11.1	5.528		250	75	125				S
Copper	85.88	22.1	5.528	44.14	755	75	125				S
Lead	48.65	11.1	5.528	22.61	471	75	125				S
Zinc	125.4	111	5.528	54.39	1280	75	125				S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255705

Sample ID: **1802987-032AMSD** Client ID: **C24 (0-1) 020818** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363513**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255705** Analysis Date: **02/20/2018** Seq No: **8031660**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	7.406	1.11	5.529		134	75	125	13.82	60.5	20	SR
Copper	48.03	22.1	5.529	44.14	70.4	75	125	85.88	56.5	20	SR
Lead	24.51	11.1	5.529	22.61	34.3	75	125	48.65	66.0	20	SR
Zinc	67.73	55.3	5.529	54.39	241	75	125	125.4	59.7	20	SR

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255713

Sample ID: **MB-255713** Client ID: Units: **ug/Kg** Prep Date: **02/12/2018** Run No: **363380**
SampleType: **MBLK** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255713** Analysis Date: **02/16/2018** Seq No: **8028667**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-255713** Client ID: Units: **ug/Kg** Prep Date: **02/12/2018** Run No: **363380**
SampleType: **LCS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255713** Analysis Date: **02/16/2018** Seq No: **8028668**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	4372	4000	5000		87.4	80	120				
Copper	5103	100	5000	77.39	101	80	120				
Lead	5104	50.0	5000		102	80	120				
Zinc	4473	500	5000		89.5	80	120				

Sample ID: **1802987-046AMS** Client ID: **D18 (0-1) 020818** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363380**
SampleType: **MS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255713** Analysis Date: **02/16/2018** Seq No: **8028670**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	313.9	35.6	4.749	311.9	42.0	75	125				S
Copper	196.1	4.75	4.749	525.8	-6940	75	125				S
Lead	3391	2.37	4.749	3604	-4470	75	125				S
Zinc	320.6	23.7	4.749	599.3	-5870	75	125				S

Sample ID: **1802987-046AMSD** Client ID: **D18 (0-1) 020818** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363380**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255713** Analysis Date: **02/16/2018** Seq No: **8028671**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	292.3	35.6	4.740	311.9	-414	75	125	313.9	7.13	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255713

Sample ID: **1802987-046AMSD** Client ID: **D18 (0-1) 020818** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363380**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255713** Analysis Date: **02/16/2018** Seq No: **8028671**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	176.2	4.74	4.740	525.8	-7380	75	125	196.1	10.7	20	S
Lead	3090	2.37	4.740	3604	-10800	75	125	3391	9.31	20	S
Zinc	338.8	23.7	4.740	599.3	-5500	75	125	320.6	5.52	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255725

Sample ID: **MB-255725** Client ID: Units: **ug/Kg** Prep Date: **02/13/2018** Run No: **363318**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255725** Analysis Date: **02/14/2018** Seq No: **8026661**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	15.82	0	16.67		94.9	45	128				
Surr: Tetrachloro-m-xylene	11.74	0	16.67		70.4	46	120				

Sample ID: **LCS-255725** Client ID: Units: **ug/Kg** Prep Date: **02/13/2018** Run No: **363318**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255725** Analysis Date: **02/14/2018** Seq No: **8026662**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	32.53	3.3	33.33		97.6	69.4	124				
Dieldrin	30.10	3.3	33.33		90.3	67.8	120				
gamma-BHC	28.24	1.7	33.33		84.7	68.2	118				
Heptachlor	31.25	1.7	33.33		93.7	61.8	121				
Surr: Decachlorobiphenyl	16.09	0	16.67		96.5	45	128				
Surr: Tetrachloro-m-xylene	12.83	0	16.67		77.0	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255725

Sample ID: **1802987-008BMS**	Client ID: **D33 (0-1) 020618**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363318**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255725**		Analysis Date: **02/14/2018**		Seq No: **8026676**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	12.15	0.43	0.0432	7.997	9630	42.2	125				S
Dieldrin	0.5644	0.43	0.0432	0.4021	376	50.4	120				S
gamma-BHC	BRL	0.22	0.0432		0	50.3	120				S
Heptachlor	BRL	0.22	0.0432		0	50.2	119				S
Surr: Decachlorobiphenyl	0.03126	0	0.0216		145	45	128				S
Surr: Tetrachloro-m-xylene	0.02120	0	0.0216		98.2	46	120				

Sample ID: **1802987-008BMSD**	Client ID: **D33 (0-1) 020618**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363318**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255725**		Analysis Date: **02/14/2018**		Seq No: **8026677**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dieldrin	0.4608	0.43	0.0432	0.4021	136	50.4	120	0.5644	20.2	33.1	S
gamma-BHC	BRL	0.22	0.0432		0	50.3	120	0	0	25.3	S
Heptachlor	BRL	0.22	0.0432		0	50.2	119	0	0	26.3	S
Surr: Decachlorobiphenyl	0.02530	0	0.0216		117	45	128	0.03126	0	0	
Surr: Tetrachloro-m-xylene	0.02263	0	0.0216		105	46	120	0.02120	0	0	

Sample ID: **1802987-008BMSD**	Client ID: **D33 (0-1) 020618**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363474**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255725**		Analysis Date: **02/20/2018**		Seq No: **8030706**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	14.82	0.86	0.0432	7.997	15800	42.2	125	12.15	19.8	24.1	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255746

Sample ID: **MB-255746** Client ID: Units: **ug/Kg** Prep Date: **02/13/2018** Run No: **363318**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255746** Analysis Date: **02/14/2018** Seq No: **8026659**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	14.18	0	16.67		85.0	45	128				
Surr: Tetrachloro-m-xylene	11.38	0	16.67		68.3	46	120				

Sample ID: **LCS-255746** Client ID: Units: **ug/Kg** Prep Date: **02/13/2018** Run No: **363318**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255746** Analysis Date: **02/14/2018** Seq No: **8026660**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	28.94	3.3	33.33		86.8	69.4	124				
Dieldrin	25.76	3.3	33.33		77.3	67.8	120				
gamma-BHC	24.12	1.7	33.33		72.4	68.2	118				
Heptachlor	26.67	1.7	33.33		80.0	61.8	121				
Surr: Decachlorobiphenyl	14.14	0	16.67		84.8	45	128				
Surr: Tetrachloro-m-xylene	10.67	0	16.67		64.0	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255746

Sample ID: **1802987-032BMS**	Client ID: **C24 (0-1) 020818**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363320**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **255746**		Analysis Date: **02/16/2018**		Seq No: **8030601**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.04074	0.0048	0.0477	0.07520	-72.3	42.2	125				S
Dieldrin	0.03422	0.0048	0.0477	0.002256	67.1	50.4	120				
gamma-BHC	0.03235	0.0024	0.0477		67.9	50.3	120				
Heptachlor	0.03670	0.0024	0.0477		77.0	50.2	119				
Surr: Decachlorobiphenyl	0.01702	0	0.0238		71.4	45	128				
Surr: Tetrachloro-m-xylene	0.01399	0	0.0238		58.7	46	120				

Sample ID: **1802987-032BMSD**	Client ID: **C24 (0-1) 020818**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363320**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **255746**		Analysis Date: **02/16/2018**		Seq No: **8030602**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	0.04447	0.0048	0.0477	0.07520	-64.5	42.2	125	0.04074	8.74	24.1	S
Dieldrin	0.03329	0.0048	0.0477	0.002256	65.1	50.4	120	0.03422	2.77	33.1	
gamma-BHC	0.03016	0.0024	0.0477		63.3	50.3	120	0.03235	7.00	25.3	
Heptachlor	0.03459	0.0024	0.0477		72.6	50.2	119	0.03670	5.92	26.3	
Surr: Decachlorobiphenyl	0.01631	0	0.0238		68.4	45	128	0.01702	0	0	
Surr: Tetrachloro-m-xylene	0.01328	0	0.0238		55.7	46	120	0.01399	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255765

Sample ID: **MB-255765** Client ID: Units: **ug/Kg** Prep Date: **02/13/2018** Run No: **363432**
SampleType: **MBLK** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255765** Analysis Date: **02/19/2018** Seq No: **8029891**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-255765** Client ID: Units: **ug/Kg** Prep Date: **02/13/2018** Run No: **363432**
SampleType: **LCS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255765** Analysis Date: **02/19/2018** Seq No: **8029892**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	4685	4500	5000		93.7	80	120				
Copper	4603	100	5000	67.57	90.7	80	120				
Lead	5321	50.0	5000		106	80	120				
Zinc	4556	500	5000		91.1	80	120				

Sample ID: **1802987-080AMS** Client ID: **E11 (0-1) 020918** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363432**
SampleType: **MS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255765** Analysis Date: **02/19/2018** Seq No: **8029894**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	460.6	361	4.812	495.0	-714	75	125				S
Lead	3736	2.41	4.812	4340	-12500	75	125				S

Sample ID: **1802987-080AMS** Client ID: **E11 (0-1) 020918** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363512**
SampleType: **MS** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255765** Analysis Date: **02/20/2018** Seq No: **8032307**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	1488	4.81	4.812	2365	-18200	75	125				S
Zinc	2978	24.1	4.812	4734	-36500	75	125				S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255765

Sample ID: **1802987-080AMSD**	Client ID: **E11 (0-1) 020918**	Units: **mg/Kg-dry**	Prep Date: **02/13/2018**	Run No: **363432**
SampleType: **MSD**	TestCode: **Metals by ICP/MS SW6020B**	BatchID: **255765**	Analysis Date: **02/19/2018**	Seq No: **8029917**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	526.7	362	4.831	495.0	657	75	125	460.6	13.4	20	S
Lead	4517	2.42	4.831	4340	3660	75	125	3736	18.9	20	S

Sample ID: **1802987-080AMSD**	Client ID: **E11 (0-1) 020918**	Units: **mg/Kg-dry**	Prep Date: **02/13/2018**	Run No: **363512**
SampleType: **MSD**	TestCode: **Metals by ICP/MS SW6020B**	BatchID: **255765**	Analysis Date: **02/20/2018**	Seq No: **8032315**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	1392	4.83	4.831	2365	-20100	75	125	1488	6.62	20	S
Zinc	4156	24.2	4.831	4734	-12000	75	125	2978	33.0	20	SR

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255768

Sample ID: **MB-255768**	Client ID:				Units: **ug/Kg**		Prep Date: **02/13/2018**		Run No: **363310**	
SampleType: **MBLK**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255768**		Analysis Date: **02/16/2018**		Seq No: **8026544**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	7500									
Copper	BRL	100									
Lead	BRL	50.0									
Zinc	BRL	500									

Sample ID: **LCS-255768**	Client ID:				Units: **ug/Kg**		Prep Date: **02/13/2018**		Run No: **363310**	
SampleType: **LCS**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255768**		Analysis Date: **02/16/2018**		Seq No: **8026547**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	5924	5500	5000	208.6	114	80	120				
Copper	5599	100	5000	57.38	111	80	120				
Lead	4935	50.0	5000		98.7	80	120				
Zinc	5319	500	5000		106	80	120				

Sample ID: **1802987-089AMS**	Client ID: **C8 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363310**	
SampleType: **MS**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255768**		Analysis Date: **02/16/2018**		Seq No: **8026549**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	125.2	37.1	4.947	101.9	470	75	125				S
Copper	341.1	4.95	4.947	268.3	1470	75	125				S
Lead	1569	2.47	4.947	1508	1240	75	125				S
Zinc	835.9	24.7	4.947	893.0	-1160	75	125				S

Sample ID: **1802987-089AMSD**	Client ID: **C8 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/13/2018**		Run No: **363310**	
SampleType: **MSD**	TestCode: **Metals by ICP/MS SW6020B**				BatchID: **255768**		Analysis Date: **02/16/2018**		Seq No: **8026550**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	140.8	37.1	4.950	101.9	785	75	125	125.2	11.7	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255768

Sample ID: **1802987-089AMSD** Client ID: **C8 (0-1) 020918** Units: **mg/Kg-dry** Prep Date: **02/13/2018** Run No: **363310**
SampleType: **MSD** TestCode: **Metals by ICP/MS SW6020B** BatchID: **255768** Analysis Date: **02/16/2018** Seq No: **8026550**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Copper	365.4	4.95	4.950	268.3	1960	75	125	341.1	6.88	20	S
Lead	1754	2.47	4.950	1508	4980	75	125	1569	11.1	20	S
Zinc	905.2	24.7	4.950	893.0	246	75	125	835.9	7.96	20	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255791

Sample ID: **MB-255791** Client ID: Units: **ug/Kg** Prep Date: **02/14/2018** Run No: **363319**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255791** Analysis Date: **02/15/2018** Seq No: **8026723**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	14.63	0	16.67		87.8	45	128				
Surr: Tetrachloro-m-xylene	13.04	0	16.67		78.2	46	120				

Sample ID: **LCS-255791** Client ID: Units: **ug/Kg** Prep Date: **02/14/2018** Run No: **363474**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255791** Analysis Date: **02/20/2018** Seq No: **8030703**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	30.37	3.3	33.33		91.1	69.4	124				
Dieldrin	27.80	3.3	33.33		83.4	67.8	120				
gamma-BHC	28.10	1.7	33.33		84.3	68.2	118				
Heptachlor	29.38	1.7	33.33		88.2	61.8	121				
Surr: Decachlorobiphenyl	15.51	0	16.67		93.0	45	128				
Surr: Tetrachloro-m-xylene	13.11	0	16.67		78.6	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255791

Sample ID: **1802987-046BMS**	Client ID: **D18 (0-1) 020818**				Units: **mg/Kg-dry**		Prep Date: **02/14/2018**		Run No: **363320**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **255791**		Analysis Date: **02/16/2018**		Seq No: **8026818**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	BRL	43	0.0428	28.14	5150	42.2	125				S
Dieldrin	BRL	43	0.0428	11.37	-26600	50.4	120				S
gamma-BHC	BRL	21	0.0428		0	50.3	120				S
Heptachlor	BRL	21	0.0428		0	50.2	119				S
Surr: Decachlorobiphenyl	0	0	0.0214		0	45	128				S
Surr: Tetrachloro-m-xylene	0	0	0.0214		0	46	120				S

Sample ID: **1802987-046BMSD**	Client ID: **D18 (0-1) 020818**				Units: **mg/Kg-dry**		Prep Date: **02/14/2018**		Run No: **363320**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **255791**		Analysis Date: **02/16/2018**		Seq No: **8026819**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	55.47	43	0.0428	28.14	63800	42.2	125	30.35	58.5	24.1	SR
Dieldrin	BRL	43	0.0428	11.37	-26600	50.4	120	0	0	33.1	S
gamma-BHC	BRL	21	0.0428		0	50.3	120	0	0	25.3	S
Heptachlor	BRL	21	0.0428		0	50.2	119	0	0	26.3	S
Surr: Decachlorobiphenyl	0	0	0.0214		0	45	128	0	0	0	S
Surr: Tetrachloro-m-xylene	0	0	0.0214		0	46	120	0	0	0	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255820

Sample ID: **MB-255820** Client ID: Units: **ug/Kg** Prep Date: **02/14/2018** Run No: **363180**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255820** Analysis Date: **02/15/2018** Seq No: **8023051**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	11.94	0	16.67		71.6	45	128				
Surr: Tetrachloro-m-xylene	9.410	0	16.67		56.5	46	120				

Sample ID: **LCS-255820** Client ID: Units: **ug/Kg** Prep Date: **02/14/2018** Run No: **363180**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255820** Analysis Date: **02/15/2018** Seq No: **8023053**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	28.76	3.3	33.33		86.3	69.4	124				
Dieldrin	24.09	3.3	33.33		72.3	67.8	120				
gamma-BHC	22.74	1.7	33.33		68.2	68.2	118				
Heptachlor	23.38	1.7	33.33		70.2	61.8	121				
Surr: Decachlorobiphenyl	12.15	0	16.67		72.9	45	128				
Surr: Tetrachloro-m-xylene	10.01	0	16.67		60.0	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255820

Sample ID: **1802987-089BMS**	Client ID: **C8 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/14/2018**		Run No: **363319**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255820**		Analysis Date: **02/15/2018**		Seq No: **8026730**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dieldrin	0.6548	0.085	0.0427	0.6253	69.0	50.4	120				
gamma-BHC	0.1469	0.043	0.0427	0.06030	203	50.3	120				S
Heptachlor	BRL	0.043	0.0427		92.1	50.2	119				
Surr: Decachlorobiphenyl	0.06640	0	0.0214		311	45	128				S
Surr: Tetrachloro-m-xylene	0.01280	0	0.0214		59.9	46	120				

Sample ID: **1802987-089BMS**	Client ID: **C8 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/14/2018**		Run No: **363320**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255820**		Analysis Date: **02/17/2018**		Seq No: **8026849**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	14.23	0.85	0.0427	15.86	-3810	42.2	125				S

Sample ID: **1802987-089BMSD**	Client ID: **C8 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/14/2018**		Run No: **363319**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255820**		Analysis Date: **02/15/2018**		Seq No: **8026731**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dieldrin	0.6356	0.085	0.0427	0.6253	24.1	50.4	120	0.6548	2.97	33.1	S
gamma-BHC	0.09536	0.043	0.0427	0.06030	82.0	50.3	120	0.1469	42.5	25.3	R
Heptachlor	0.04808	0.043	0.0427		112	50.2	119	0.03935	20.0	26.3	
Surr: Decachlorobiphenyl	0.06577	0	0.0214		308	45	128	0.06640	0	0	S
Surr: Tetrachloro-m-xylene	0.01408	0	0.0214		65.9	46	120	0.01280	0	0	

Sample ID: **1802987-089BMSD**	Client ID: **C8 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/14/2018**		Run No: **363320**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL** **SW8081B**				BatchID: **255820**		Analysis Date: **02/17/2018**		Seq No: **8026850**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	12.87	0.85	0.0427	15.86	-6990	42.2	125	14.23	10.0	24.1	S

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255896

Sample ID: **MB-255896** Client ID: Units: **ug/Kg** Prep Date: **02/16/2018** Run No: **363507**
SampleType: **MBLK** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255896** Analysis Date: **02/16/2018** Seq No: **8031268**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDD	BRL	3.3									
4,4´-DDE	BRL	3.3									
4,4´-DDT	BRL	3.3									
alpha-BHC	BRL	1.7									
alpha-Chlordane	BRL	1.7									
beta-BHC	BRL	1.7									
delta-BHC	BRL	1.7									
Dieldrin	BRL	3.3									
gamma-BHC	BRL	1.7									
gamma-Chlordane	BRL	1.7									
Heptachlor	BRL	1.7									
Methoxychlor	BRL	17									
Toxaphene	BRL	170									
Surr: Decachlorobiphenyl	14.09	0	16.67		84.6	45	128				
Surr: Tetrachloro-m-xylene	12.91	0	16.67		77.4	46	120				

Sample ID: **LCS-255896** Client ID: Units: **ug/Kg** Prep Date: **02/16/2018** Run No: **363507**
SampleType: **LCS** TestCode: **CHLORINATED PESTICIDES, TCL SW8081B** BatchID: **255896** Analysis Date: **02/16/2018** Seq No: **8031269**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
4,4´-DDT	35.49	3.3	33.33		106	69.4	124				
Dieldrin	31.10	3.3	33.33		93.3	67.8	120				
gamma-BHC	31.33	1.7	33.33		94.0	68.2	118				
Heptachlor	32.64	1.7	33.33		97.9	61.8	121				
Surr: Decachlorobiphenyl	15.22	0	16.67		91.3	45	128				
Surr: Tetrachloro-m-xylene	13.65	0	16.67		81.9	46	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: AMEC Foster Wheeler
Project Name: BFEL - Atlanta
Workorder: 1802987

ANALYTICAL QC SUMMARY REPORT

BatchID: 255896

Sample ID: **1802987-078BMS**	Client ID: **E12 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/16/2018**		Run No: **363507**	
SampleType: **MS**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **255896**		Analysis Date: **02/16/2018**		Seq No: **8031312**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dieldrin	0.9005	0.090	0.0453	0.7664	296	50.4	120				S
gamma-BHC	0.05785	0.045	0.0453	0.02647	69.3	50.3	120				
Heptachlor	0.5622	0.045	0.0453	0.4208	312	50.2	119				S
Surr: Decachlorobiphenyl	0.01904	0	0.0226		84.1	45	128				
Surr: Tetrachloro-m-xylene	0.01947	0	0.0226		86.0	46	120				

Sample ID: **1802987-078BMSD**	Client ID: **E12 (0-1) 020918**				Units: **mg/Kg-dry**		Prep Date: **02/16/2018**		Run No: **363507**	
SampleType: **MSD**	TestCode: **CHLORINATED PESTICIDES, TCL SW8081B**				BatchID: **255896**		Analysis Date: **02/16/2018**		Seq No: **8031353**	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Dieldrin	0.9371	0.090	0.0453	0.7664	377	50.4	120	0.9005	3.99	33.1	S
gamma-BHC	0.06944	0.045	0.0453	0.02647	94.9	50.3	120	0.05785	18.2	25.3	
Heptachlor	0.8254	0.045	0.0453	0.4208	893	50.2	119	0.5622	37.9	26.3	SR
Surr: Decachlorobiphenyl	0.01492	0	0.0226		65.9	45	128	0.01904	0	0	
Surr: Tetrachloro-m-xylene	0.01896	0	0.0226		83.7	46	120	0.01947	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

APPENDIX B

EVALUATION OF ANNUAL AVERAGE FLOW NORMALIZED CONCENTRATIONS FOR THE UN-NAMED STREAM ON CSX PROPERTY

EVALUATION OF ANNUAL AVERAGE FLOW NORMALIZED CONCENTRATIONS FOR THE UNNAMED STREAM ON CSX PROPERTY

Georgia's Water Use Classifications and Water Quality Standards (391-3-6.03 (5) (e) (iv)) specify not-to-exceed in-stream concentrations applicable under "annual average or higher stream flow conditions" for a select list of chemical constituents. Two of these constituents, alpha-BHC and beta-BHC have been detected in the unnamed tributary to Woodall Creek on CSX property at concentrations exceeding allowable in-stream concentrations. Therefore, Wood (formerly Amec Foster Wheeler) determined the annual average stream flow for Woodall Creek, the receiving stream for the unnamed stream on CSX property. The DeFoors Ferry United States Geological Survey (USGS) Gage number 02336313 was used in normalizing the measured in-stream sampling results to a long-term (30-year) annual average stream flow condition.

Determination of Annual Average Flow for Woodall Creek

The 30-year average flow for Woodall Creek was determined utilizing the USGS continuous stream flow record for Woodall Creek at DeFoors Ferry, which began in 2006, in combination with the nearby Peachtree Creek USGS Gage number 02336300, which began continuous operation in 1958 and can, therefore, be used as a reference or index station for record extension and augmentation of the data available for the Woodall Creek DeFoors Ferry Gage. Based on the below information, the calculated annual average flow for Woodall Creek at DeFoors Ferry Gage is 4.84 cubic feet per second (cfs).

Woodall Creek DeFoors Ferry Gage 2011 – 2017

Sum of the Annual Average Flow – 28.21 cfs
Number of records – 7
Average Annual Flow 28.21 cfs / 7 = 4.03 cfs

Peachtree Creek Gage – 2011 - 2017

Sum of Annual Average Flow – 752.2 cfs
Number of Records – 7
Average Annual Flow 752.2 cfs / 7 = 107.46 cfs

Peachtree Creek Gage 1988 – 2017

Sum of Annual Average Flow – 3,873.5 cfs
Number of Records – 30
Average Annual Flow 3,873.5 cfs / 30 = 129.12 cfs

Information obtained from the USGS Surface Water Annual Statistics is included as **Attachment 1**. The long-term annual average flow for the Woodall Creek Gage adjusted to the 30 year base period for Peachtree Creek Gage is calculated as:

(4.03 / 107.46) * 129.12 = 4.84 cfs

Determination of Surface Water Concentration Normalization Factor

The average stream flow in Woodall Creek, as measured at the DeFoors Ferry Gage at the time of sampling on May 18, 2018 (9:55 am to 12:01 pm) was 1.36 cfs (see **Attachment 1**).

Normalized surface water analytical results for the unnamed stream surface water samples collected on May 18, 2018 were derived by multiplying the actual analytical sample results by the ratio of the concurrent instantaneous stream flow recorded at the Woodall Creek DeFoors Ferry USGS Gage for the specific time of surface water sampling (1.36 cfs) divided by the long-term annual average stream-flow determined for the Woodall Creek Gage based on the above methodology (4.84 cfs). The flow normalized analytical results are presented on **Table B-1** along with measured surface water concentrations. Both the raw results and the flow normalized results from May 18, 2018 exceed allowable in-stream concentrations for alpha and beta-BHC at the eight sample locations.

TABLE B-1: ANNUAL AVERAGE FLOW NORMALIZED SURFACE WATER ANALYTICAL RESULTS

Sample Location			SW-2010-5		SW2010-10		SW-2010-11		SW-2010-14		SW-2010-15		SW-2010-17		SW-2014-20		SW-2014-21	
Sample Date			5/18/2018		5/18/2018		5/18/2018		5/18/2018		5/18/2018		5/18/2018		5/18/2018		5/18/2018	
PARAMETER (units)	**GA Instream**	**GA Instream Human Health**	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]	Raw Result	Annual Average Flow Normalized Result[(1)]
	Ecological Exposure	**Human Health Exposure**																
Dissolved Arsenic (mg/L)	0.15	---	0.004 JQ	0.001	0.00384 JQ	0.001	0.00434 JQ	0.001	0.00211 JQ	0.001	0.00241 JQ	0.001	0.0024 JQ	0.001	<0.041	--	<0.041	--
alpha-BHC (ug/L)	not established	0.0049	**0.052**	**0.015**	**0.12 JH**	**0.034**	**0.12**	**0.034**	**0.26**	**0.073**	**0.20 JH**	**0.056**	**0.20 JH**	**0.056**	**0.18**	**0.050**	**0.14**	**0.039**
beta-BHC (ug/L)	not established	0.017	**0.033 JQ**	0.009	<0.004	--	**0.046 JQ**	0.013	**0.36**	**0.101**	**0.30 JH**	**0.084**	**0.30 JH**	**0.084**	**1.10**	**0.308**	**1.20**	**0.336**
gamma-BHC (lindane) (ug/L)	0.95	1.8	0.035 JQ	0.010	0.074 JH	0.021	0.07	0.020	0.10	0.028	0.084 JH	0.024	0.091 JH	0.025	0.11	0.031	0.091	0.025
Dieldrin (ug/L)	0.056	0.000054	<0.005	--	<0.005	--	<0.005	--	<0.0083 JQ	--	<0.005	--	<0.005	--	0.023 JQ	0.006	0.03 JQ	0.008

Notes:

mg/L = milligrams per liter

ug/L = micrograms per liter

JH - Estimated value detected below Reporting Limit (RL), possibly biased high

JQ - Estimated, detected between the Method Detection Limit (MDL) and RL

(1) - Results normalized by multiplying raw result by ratio of instantaneous flow in Woodall Creek at the time of sampling (1.36 cfs) to long-term annual average flow in Woodall Creek (4.84 cfs): 1.36/ 4.84= 0.28 cfs

Bolded results indicate concentrations exceed ecological exposure value as a default and where no value is established compared to human health exposure.

Prepared by: AS 6/27/2018
Checked by: RNQ 7/9/2018

ATTACHMENT 1

WOODALL CREEK DEFOORS FERRY GAGE DAILY ON MAY 18, 2018 FLOW DATA

DATA FOR WOODALL CREEK 30-YEAR ANNUAL AVERAGE FLOW DETERMINATION

---------- WARNING ----------
Some of the data that you have obtained from this U.S. Geological Survey database
may not have received Director's approval. Any such data values are qualified
as provisional and are subject to revision. Provisional data are released on the
condition that neither the USGS nor the United States Government may be held liable
for any damages resulting from its use.
#
Additional info: https://help.waterdata.usgs.gov/policies/provisional-data-statement
#
File-format description: https://help.waterdata.usgs.gov/faq/about-tab-delimited-output
Automated-retrieval info: https://help.waterdata.usgs.gov/faq/automated-retrievals
#
Contact: gs-w_support_nwisweb@usgs.gov
retrieved: 2018-06-15 17:15:38 EDT (caww01)
#
Data for the following 1 site(s) are contained in this file
USGS 02336313 WOODALL CREEK AT DEFOORS FERRY RD, AT ATLANTA, GA

#
Data provided for site 02336313
TS parameter Description
39641 00060 Discharge, cubic feet per second
39642 00065 Gage height, feet
39644 00010 Temperature, water, degrees Celsius
#
Data-value qualification codes included in this output:
P Provisional data subject to revision.
#

agency_cd	site_no	datetime	tz_cd	39641_00060	39641_00060_cd	39642_00065	39642_00065_cd	39644_00010	39644_00010_cd
5s	15s	20d	6s	14n	10s	14n	10s	14n	10s
USGS	02336313	2018-05-18 00:00	EDT	6.62	P	0.77	P	22.5	P
USGS	02336313	2018-05-18 00:15	EDT	6.28	P	0.76	P	22.4	P
USGS	02336313	2018-05-18 00:30	EDT	5.96	P	0.75	P	22.3	P
USGS	02336313	2018-05-18 00:45	EDT	5.36	P	0.73	P	22.2	P
USGS	02336313	2018-05-18 01:00	EDT	5.07	P	0.72	P	22.2	P
USGS	02336313	2018-05-18 01:15	EDT	4.54	P	0.70	P	22.1	P
USGS	02336313	2018-05-18 01:30	EDT	4.29	P	0.69	P	22.0	P
USGS	02336313	2018-05-18 01:45	EDT	4.05	P	0.68	P	21.9	P
USGS	02336313	2018-05-18 02:00	EDT	3.60	P	0.66	P	21.9	P
USGS	02336313	2018-05-18 02:15	EDT	3.60	P	0.66	P	21.8	P
USGS	02336313	2018-05-18 02:30	EDT	3.39	P	0.65	P	21.8	P
USGS	02336313	2018-05-18 02:45	EDT	3.18	P	0.64	P	21.7	P
USGS	02336313	2018-05-18 03:00	EDT	3.18	P	0.64	P	21.7	P
USGS	02336313	2018-05-18 03:15	EDT	2.99	P	0.63	P	21.6	P
USGS	02336313	2018-05-18 03:30	EDT	2.81	P	0.62	P	21.6	P
USGS	02336313	2018-05-18 03:45	EDT	2.64	P	0.61	P	21.6	P
USGS	02336313	2018-05-18 04:00	EDT	2.47	P	0.60	P	21.5	P
USGS	02336313	2018-05-18 04:15	EDT	2.47	P	0.60	P	21.5	P
USGS	02336313	2018-05-18 04:30	EDT	2.31	P	0.59	P	21.4	P
USGS	02336313	2018-05-18 04:45	EDT	2.31	P	0.59	P	21.4	P
USGS	02336313	2018-05-18 05:00	EDT	2.16	P	0.58	P	21.3	P
USGS	02336313	2018-05-18 05:15	EDT	2.02	P	0.57	P	21.3	P

USGS	02336313	2018-05-18 05:30	EDT	2.02	P	0.57	P	21.2	P
USGS	02336313	2018-05-18 05:45	EDT	1.88	P	0.56	P	21.2	P
USGS	02336313	2018-05-18 06:00	EDT	1.88	P	0.56	P	21.1	P
USGS	02336313	2018-05-18 06:15	EDT	1.88	P	0.56	P	21.1	P
USGS	02336313	2018-05-18 06:30	EDT	1.75	P	0.55	P	21.1	P
USGS	02336313	2018-05-18 06:45	EDT	1.75	P	0.55	P	21.0	P
USGS	02336313	2018-05-18 07:00	EDT	1.75	P	0.55	P	21.0	P
USGS	02336313	2018-05-18 07:15	EDT	1.63	P	0.54	P	21.0	P
USGS	02336313	2018-05-18 07:30	EDT	1.63	P	0.54	P	21.0	P
USGS	02336313	2018-05-18 07:45	EDT	1.63	P	0.54	P	21.0	P
USGS	02336313	2018-05-18 08:00	EDT	1.52	P	0.53	P	20.9	P
USGS	02336313	2018-05-18 08:15	EDT	1.52	P	0.53	P	20.9	P
USGS	02336313	2018-05-18 08:30	EDT	1.52	P	0.53	P	20.9	P
USGS	02336313	2018-05-18 08:45	EDT	1.52	P	0.53	P	20.9	P
USGS	02336313	2018-05-18 09:00	EDT	1.52	P	0.53	P	20.9	P
USGS	02336313	2018-05-18 09:15	EDT	1.41	P	0.52	P	20.9	P
USGS	02336313	2018-05-18 09:30	EDT	1.41	P	0.52	P	20.9	P
USGS	02336313	2018-05-18 09:45	EDT	1.41	P	0.52	P	21.0	P
USGS	02336313	2018-05-18 10:00	EDT	1.41	P	0.52	P	21.0	P
USGS	02336313	2018-05-18 10:15	EDT	1.41	P	0.52	P	21.0	P
USGS	02336313	2018-05-18 10:30	EDT	1.41	P	0.52	P	21.3	P
USGS	02336313	2018-05-18 10:45	EDT	1.41	P	0.52	P	21.4	P
USGS	02336313	2018-05-18 11:00	EDT	1.31	P	0.51	P	21.6	P
USGS	02336313	2018-05-18 11:15	EDT	1.31	P	0.51	P	21.8	P
USGS	02336313	2018-05-18 11:30	EDT	1.31	P	0.51	P	22.1	P
USGS	02336313	2018-05-18 11:45	EDT	1.31	P	0.51	P	22.4	P
USGS	02336313	2018-05-18 12:00	EDT	1.31	P	0.51	P	22.6	P
USGS	02336313	2018-05-18 12:15	EDT	1.31	P	0.51	P	22.6	P
USGS	02336313	2018-05-18 12:30	EDT	1.31	P	0.51	P	22.8	P
USGS	02336313	2018-05-18 12:45	EDT	1.31	P	0.51	P	22.8	P
USGS	02336313	2018-05-18 13:00	EDT	1.31	P	0.51	P	22.8	P
USGS	02336313	2018-05-18 13:15	EDT	1.31	P	0.51	P	22.8	P
USGS	02336313	2018-05-18 13:30	EDT	1.31	P	0.51	P	23.1	P
USGS	02336313	2018-05-18 13:45	EDT	1.31	P	0.51	P	23.2	P
USGS	02336313	2018-05-18 14:00	EDT	1.21	P	0.50	P	23.6	P
USGS	02336313	2018-05-18 14:15	EDT	1.21	P	0.50	P	23.7	P
USGS	02336313	2018-05-18 14:30	EDT	1.21	P	0.50	P	23.8	P
USGS	02336313	2018-05-18 14:45	EDT	1.21	P	0.50	P	23.8	P
USGS	02336313	2018-05-18 15:00	EDT	1.21	P	0.50	P	24.0	P
USGS	02336313	2018-05-18 15:15	EDT	1.21	P	0.50	P	24.1	P
USGS	02336313	2018-05-18 15:30	EDT	1.21	P	0.50	P	24.1	P
USGS	02336313	2018-05-18 15:45	EDT	1.21	P	0.50	P	24.1	P
USGS	02336313	2018-05-18 16:00	EDT	1.12	P	0.49	P	24.1	P
USGS	02336313	2018-05-18 16:15	EDT	1.12	P	0.49	P	24.1	P
USGS	02336313	2018-05-18 16:30	EDT	1.12	P	0.49	P	24.1	P
USGS	02336313	2018-05-18 16:45	EDT	1.12	P	0.49	P	24.1	P
USGS	02336313	2018-05-18 17:00	EDT	1.12	P	0.49	P	24.1	P
USGS	02336313	2018-05-18 17:15	EDT	1.12	P	0.49	P	24.1	P
USGS	02336313	2018-05-18 17:30	EDT	1.12	P	0.49	P	24.0	P
USGS	02336313	2018-05-18 17:45	EDT	1.12	P	0.49	P	24.0	P
USGS	02336313	2018-05-18 18:00	EDT	1.12	P	0.49	P	23.9	P
USGS	02336313	2018-05-18 18:15	EDT	1.03	P	0.48	P	23.9	P
USGS	02336313	2018-05-18 18:30	EDT	1.03	P	0.48	P	23.8	P
USGS	02336313	2018-05-18 18:45	EDT	1.03	P	0.48	P	23.8	P

USGS	02336313	2018-05-18 19:00	EDT	1.12	P	0.49	P	23.8	P
USGS	02336313	2018-05-18 19:15	EDT	1.03	P	0.48	P	23.7	P
USGS	02336313	2018-05-18 19:30	EDT	1.03	P	0.48	P	23.6	P
USGS	02336313	2018-05-18 19:45	EDT	1.03	P	0.48	P	23.6	P
USGS	02336313	2018-05-18 20:00	EDT	1.03	P	0.48	P	23.5	P
USGS	02336313	2018-05-18 20:15	EDT	1.03	P	0.48	P	23.4	P
USGS	02336313	2018-05-18 20:30	EDT	1.03	P	0.48	P	23.4	P
USGS	02336313	2018-05-18 20:45	EDT	1.03	P	0.48	P	23.3	P
USGS	02336313	2018-05-18 21:00	EDT	1.03	P	0.48	P	23.2	P
USGS	02336313	2018-05-18 21:15	EDT	1.03	P	0.48	P	23.2	P
USGS	02336313	2018-05-18 21:30	EDT	1.03	P	0.48	P	23.1	P
USGS	02336313	2018-05-18 21:45	EDT	1.03	P	0.48	P	23.0	P
USGS	02336313	2018-05-18 22:00	EDT	1.03	P	0.48	P	23.0	P
USGS	02336313	2018-05-18 22:15	EDT	1.03	P	0.48	P	22.9	P
USGS	02336313	2018-05-18 22:30	EDT	1.03	P	0.48	P	22.8	P
USGS	02336313	2018-05-18 22:45	EDT	1.03	P	0.48	P	22.7	P
USGS	02336313	2018-05-18 23:00	EDT	1.03	P	0.48	P	22.6	P
USGS	02336313	2018-05-18 23:15	EDT	1.03	P	0.48	P	22.6	P
USGS	02336313	2018-05-18 23:30	EDT	1.03	P	0.48	P	22.5	P
USGS	02336313	2018-05-18 23:45	EDT	0.95	P	0.47	P	22.4	P

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USGS 02336313 WOODALL CREEK AT DEFOORS FERRY RD, AT ATLANTA, GA

Available data for this site Time-series: Annual statistics ▼ GO

Fulton County, Georgia Hydrologic Unit Code 03130001 Latitude 33°49'18", Longitude 84°26'20" NAD27 Drainage area 2.71 square miles Contributing drainage area 2.71 square miles Gage datum 756.2 feet above NAVD88	**Output formats** HTML table of all data Tab-separated data Reselect output format

Water Year	00060, Discharge, cubic feet per second
Period-of-record for statistical calculation restricted by user	
2006	3.50
2007	2.79
2008	2.97
2009	3.05
2010	4.52
2011	1.89
2012	1.95
2013	3.53
2014	10.3
2015	3.19
2016	3.35
2017	4.00
** No Incomplete data have been used for statistical calculation	

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Some of the data that you have obtained from this U.S. Geological Survey database
may not have received Director's approval. Any such data values are qualified
as provisional and are subject to revision. Provisional data are released on the
condition that neither the USGS nor the United States Government may be held liable
for any damages resulting from its use.
#
Additional info: https://help.waterdata.usgs.gov/policies/provisional-data-statement
#
File-format description: https://help.waterdata.usgs.gov/faq/about-tab-delimited-output
Automated-retrieval info: https://help.waterdata.usgs.gov/faq/automated-retrievals
#
Contact: gs-w_support_nwisweb@usgs.gov
retrieved: 2018-06-15 17:20:16 EDT   (caww01)
#
Data for the following 1 site(s) are contained in this file
"#   USGS 02336300 PEACHTREE CREEK AT ATLANTA, GA"

#
Data provided for site 02336300
TS   parameter   Description
"#   39632   00060   Discharge, cubic feet per second"
"#   39633   00065   Gage height, feet"
"#   39634   00010   Temperature, water, degrees Celsius"
#
Data-value qualification codes included in this output:
P Provisional data subject to revision.
#

agency_cd	site_no	datetime	tz_cd	39632_00060	39632_00060_cd	39633_00065	39633_00065_cd	39634_00010	39634_00010_cd
5s	15s	20d	6s	14n	10s	14n	10s	14n	10s
USGS	2336300	5/18/2018 0:00	EDT	63.5	P	2.72	P	21.6	P
USGS	2336300	5/18/2018 0:15	EDT	63.5	P	2.72	P	21.6	P
USGS	2336300	5/18/2018 0:30	EDT	62.6	P	2.71	P	21.6	P
USGS	2336300	5/18/2018 0:45	EDT	62.6	P	2.71	P	21.6	P
USGS	2336300	5/18/2018 1:00	EDT	62.6	P	2.71	P	21.6	P
USGS	2336300	5/18/2018 1:15	EDT	61.7	P	2.7	P	21.7	P
USGS	2336300	5/18/2018 1:30	EDT	61.7	P	2.7	P	21.6	P
USGS	2336300	5/18/2018 1:45	EDT	61.7	P	2.7	P	21.6	P
USGS	2336300	5/18/2018 2:00	EDT	61.6	P	2.7	P	21.6	P
USGS	2336300	5/18/2018 2:15	EDT	60.7	P	2.69	P	21.6	P
USGS	2336300	5/18/2018 2:30	EDT	61.6	P	2.7	P	21.6	P
USGS	2336300	5/18/2018 2:45	EDT	60.7	P	2.69	P	21.6	P
USGS	2336300	5/18/2018 3:00	EDT	60.7	P	2.69	P	21.6	P
USGS	2336300	5/18/2018 3:15	EDT	59.8	P	2.68	P	21.6	P
USGS	2336300	5/18/2018 3:30	EDT	59.8	P	2.68	P	21.6	P
USGS	2336300	5/18/2018 3:45	EDT	59.8	P	2.68	P	21.6	P
USGS	2336300	5/18/2018 4:00	EDT	58.9	P	2.67	P	21.5	P
USGS	2336300	5/18/2018 4:15	EDT	58.9	P	2.67	P	21.5	P
USGS	2336300	5/18/2018 4:30	EDT	58.9	P	2.67	P	21.4	P
USGS	2336300	5/18/2018 4:45	EDT	58	P	2.66	P	21.4	P
USGS	2336300	5/18/2018 5:00	EDT	57.1	P	2.65	P	21.4	P
USGS	2336300	5/18/2018 5:15	EDT	57.1	P	2.65	P	21.3	P

USGS	2336300	5/18/2018	5:30	EDT	57.1	P	2.65	P	21.3	P
USGS	2336300	5/18/2018	5:45	EDT	57.1	P	2.65	P	21.3	P
USGS	2336300	5/18/2018	6:00	EDT	56.3	P	2.64	P	21.2	P
USGS	2336300	5/18/2018	6:15	EDT	56.3	P	2.64	P	21.2	P
USGS	2336300	5/18/2018	6:30	EDT	56.3	P	2.64	P	21.2	P
USGS	2336300	5/18/2018	6:45	EDT	56.3	P	2.64	P	21.2	P
USGS	2336300	5/18/2018	7:00	EDT	55.4	P	2.63	P	21.1	P
USGS	2336300	5/18/2018	7:15	EDT	55.4	P	2.63	P	21.1	P
USGS	2336300	5/18/2018	7:30	EDT	55.4	P	2.63	P	21.1	P
USGS	2336300	5/18/2018	7:45	EDT	54.4	P	2.62	P	21.1	P
USGS	2336300	5/18/2018	8:00	EDT	55.4	P	2.63	P	21.1	P
USGS	2336300	5/18/2018	8:15	EDT	54.4	P	2.62	P	21.1	P
USGS	2336300	5/18/2018	8:30	EDT	53.2	P	2.61	P	21.1	P
USGS	2336300	5/18/2018	8:45	EDT	53.2	P	2.61	P	21	P
USGS	2336300	5/18/2018	9:00	EDT	53.2	P	2.61	P	21.1	P
USGS	2336300	5/18/2018	9:15	EDT	53.2	P	2.61	P	21.1	P
USGS	2336300	5/18/2018	9:30	EDT	53.2	P	2.61	P	21.1	P
USGS	2336300	5/18/2018	9:45	EDT	53.2	P	2.61	P	21.1	P
USGS	2336300	5/18/2018	10:00	EDT	53.2	P	2.61	P	21.1	P
USGS	2336300	5/18/2018	10:15	EDT	52.1	P	2.6	P	21.2	P
USGS	2336300	5/18/2018	10:30	EDT	52.1	P	2.6	P	21.2	P
USGS	2336300	5/18/2018	10:45	EDT	52.1	P	2.6	P	21.3	P
USGS	2336300	5/18/2018	11:00	EDT	52.1	P	2.6	P	21.3	P
USGS	2336300	5/18/2018	11:15	EDT	52.1	P	2.6	P	21.4	P
USGS	2336300	5/18/2018	11:30	EDT	51	P	2.59	P	21.6	P
USGS	2336300	5/18/2018	11:45	EDT	52.1	P	2.6	P	21.7	P
USGS	2336300	5/18/2018	12:00	EDT	51	P	2.59	P	21.8	P
USGS	2336300	5/18/2018	12:15	EDT	51	P	2.59	P	21.9	P
USGS	2336300	5/18/2018	12:30	EDT	49.9	P	2.58	P	22	P
USGS	2336300	5/18/2018	12:45	EDT	51	P	2.59	P	22.1	P
USGS	2336300	5/18/2018	13:00	EDT	49.9	P	2.58	P	22	P
USGS	2336300	5/18/2018	13:15	EDT	49.9	P	2.58	P	22.2	P
USGS	2336300	5/18/2018	13:30	EDT	49.9	P	2.58	P	22.3	P
USGS	2336300	5/18/2018	13:45	EDT	49.9	P	2.58	P	22.4	P
USGS	2336300	5/18/2018	14:00	EDT	49.9	P	2.58	P	22.5	P
USGS	2336300	5/18/2018	14:15	EDT	49.9	P	2.58	P	22.6	P
USGS	2336300	5/18/2018	14:30	EDT	49.9	P	2.58	P	22.8	P
USGS	2336300	5/18/2018	14:45	EDT	48.8	P	2.57	P	22.9	P
USGS	2336300	5/18/2018	15:00	EDT	49.9	P	2.58	P	23.1	P
USGS	2336300	5/18/2018	15:15	EDT	48.8	P	2.57	P	23.2	P
USGS	2336300	5/18/2018	15:30	EDT	48.8	P	2.57	P	23.2	P
USGS	2336300	5/18/2018	15:45	EDT	48.8	P	2.57	P	23.3	P
USGS	2336300	5/18/2018	16:00	EDT	48.8	P	2.57	P	23.4	P
USGS	2336300	5/18/2018	16:15	EDT	48.8	P	2.57	P	23.4	P
USGS	2336300	5/18/2018	16:30	EDT	48.8	P	2.57	P	23.4	P
USGS	2336300	5/18/2018	16:45	EDT	48.8	P	2.57	P	23.5	P
USGS	2336300	5/18/2018	17:00	EDT	48.8	P	2.57	P	23.5	P
USGS	2336300	5/18/2018	17:15	EDT	47.7	P	2.56	P	23.6	P
USGS	2336300	5/18/2018	17:30	EDT	48.8	P	2.57	P	23.6	P
USGS	2336300	5/18/2018	17:45	EDT	48.8	P	2.57	P	23.6	P
USGS	2336300	5/18/2018	18:00	EDT	47.7	P	2.56	P	23.5	P
USGS	2336300	5/18/2018	18:15	EDT	47.7	P	2.56	P	23.5	P
USGS	2336300	5/18/2018	18:30	EDT	47.7	P	2.56	P	23.5	P
USGS	2336300	5/18/2018	18:45	EDT	47.7	P	2.56	P	23.5	P

USGS	2336300	5/18/2018 19:00 EDT	47.7	P	2.56	P	23.4	P
USGS	2336300	5/18/2018 19:15 EDT	47.7	P	2.56	P	23.4	P
USGS	2336300	5/18/2018 19:30 EDT	47.7	P	2.56	P	23.4	P
USGS	2336300	5/18/2018 19:45 EDT	47.7	P	2.56	P	23.3	P
USGS	2336300	5/18/2018 20:00 EDT	47.7	P	2.56	P	23.2	P
USGS	2336300	5/18/2018 20:15 EDT	47.7	P	2.56	P	23.2	P
USGS	2336300	5/18/2018 20:30 EDT	47.7	P	2.56	P	23.2	P
USGS	2336300	5/18/2018 20:45 EDT	46.7	P	2.55	P	23.1	P
USGS	2336300	5/18/2018 21:00 EDT	47.7	P	2.56	P	23.1	P
USGS	2336300	5/18/2018 21:15 EDT	47.7	P	2.56	P	23	P
USGS	2336300	5/18/2018 21:30 EDT	47.7	P	2.56	P	23	P
USGS	2336300	5/18/2018 21:45 EDT	46.7	P	2.55	P	22.9	P
USGS	2336300	5/18/2018 22:00 EDT	46.7	P	2.55	P	22.8	P
USGS	2336300	5/18/2018 22:15 EDT	46.7	P	2.55	P	22.8	P
USGS	2336300	5/18/2018 22:30 EDT	46.7	P	2.55	P	22.8	P
USGS	2336300	5/18/2018 22:45 EDT	46.7	P	2.55	P	22.8	P
USGS	2336300	5/18/2018 23:00 EDT	46.7	P	2.55	P	22.7	P
USGS	2336300	5/18/2018 23:15 EDT	46.7	P	2.55	P	22.7	P
USGS	2336300	5/18/2018 23:30 EDT	45.6	P	2.54	P	22.6	P
USGS	2336300	5/18/2018 23:45 EDT	45.6	P	2.54	P	22.6	P

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USGS 02336300 PEACHTREE CREEK AT ATLANTA, GA

Available data for this site Time-series: Annual statistics ▼ GO

Fulton County, Georgia Hydrologic Unit Code 03130001 Latitude 33°49'13.1", Longitude 84°24'27.5" NAD83 Drainage area 86.8 square miles Gage datum 763.96 feet above NGVD29	**Output formats** HTML table of all data Tab-separated data Reselect output format

Water Year	00060, Discharge, cubic feet per second
Period-of-record for statistical calculation restricted by user	
1959	74.5
1960	92.5
1961	120.2
1962	114.5
1963	142.4
1964	176.3
1965	120.0
1966	135.2
1967	163.3
1968	143.3
1969	151.8
1970	122.8
1971	140.9
1972	120.8
1973	185.0
1974	144.2
1975	202.9
1976	159.6
1977	104.8
1978	122.3

Water Year	00060, Discharge, cubic feet per second
1979	144.3
1980	166.5
1981	67.0
1982	128.4
1983	141.3
1984	201.1
1985	124.5
1986	73.9
1987	137.7
1988	78.7
1989	145.0
1990	189.8
1991	178.7
1992	128.5
1993	159.6
1994	154.8
1995	118.2
1996	193.9
1997	135.8
1998	166.0
1999	80.5
2000	95.3
2001	106.6
2002	92.3
2003	198.6
2004	145.8
2005	213.0
2006	106.9
2007	71.9
2008	67.6
2009	133.6
2010	160.2
2011	85.2
2012	68.0

Water Year	00060, Discharge, cubic feet per second
2013	135.1
2014	115.9
2015	98.0
2016	141.8
2017	108.2

** No Incomplete data have been used for statistical calculation

APPENDIX C

RISK REDUCTION STANDARDS PROTECTIVE OF HUMAN HEALTH

Appendix C Surface Soil Investigation and Averaging and Human Health

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C.1 Risk Reduction Standards Protective of Human Health

RRS were previously calculated for soil and groundwater and approved by EPD (February 2015 Status Report). Site groundwater continues to exceed RRS and the intention is to complete an environmental covenant to control the use of groundwater at the site. There is no direct exposure to groundwater at the site. One potential exposure point is a surface stream, which is downgradient and off-property. A permeable reactive barrier is planned to address the groundwater to surface water migration pathway. Because the groundwater pathway is incomplete and will remain incomplete, soil risk reduction standards (RRS) for Type 2 and 4 are based on direct contact only. Soil Type 1 and Type 3 RRS are calculated per the HSRA Rule.

As stated in the February 2018 VRP Status Report, BFEL has completed an investigation to update surficial soil concentrations for a potential Type 5 RRS closure. The 2018 site investigation was focused on the collection of surface soil using a gridded approach in order to get complete coverage of the Estech property. Updating the surface soil delineation also allows the use of current approved field and analytical techniques and for data validation. Data previously used at the Site was collected starting in the 1980s and the methods used to collect and analyze these older data were not always documented, introducing significant uncertainty. In 2018, surface soil samples were collected at the rate of eight samples per acre to support the calculation of area averaging representative of human and ecological exposure domains (EDs).

For human health, the Estech property was divided into four EDs of approximately 4.5 acres each in size with each including 36 surface soil sampling points (Figure HH1). The shapes of the EDs are based on the distribution of arsenic, one of the prime COPCs, and are grouped to include potential hotspots. The probable future use of the property is mixed use with commercial development and also limited potential for multi-family residential. The potential for Site development is still restricted by limited Site access, i.e., no road access through surrounding properties. A 4.5 acre exposure domain is considered protective of potential future receptors that include industrial/commercial and construction workers (per the approved Site RRS).

Previous investigations of the Site conducted under the HSRA Rules have indicated that some site soils exceed Types 3 and 4 Risk Reduction Standard (RRS) and may require corrective action. Per the VRP statute, the use of exposure domains and area averaging techniques are being used to evaluate the constituents and media that may result in exposure to receptors through a specified exposure pathway. For site workers, this includes incidental ingestion, dermal contact, and inhalation of fugitive dust. Leaching from the soil column to groundwater will be addressed through an environmental covenant restricting the use of groundwater at the site. For the 2018 surface soil investigation, the number of analytes have been reduced to constituents of potential concern and were limited to 4 inorganic compounds (arsenic, lead, copper, and zinc) and 13 pesticides. Previous soil analyses indicated minimal levels of volatile and semivolatile constituents and other inorganic constituents that were in compliance with soil RRS and were not frequently detected.

The U.S. Environmental Protection Agency provides Pro-UCL software to calculate Upper Confidence Limits (UCLs) and Exposure Point Concentrations (EPCs). This software was used to calculate UCLs for 16 constituents. The statistical inputs and outputs are provided in Attachment A. A seventeenth constituent, Methoxychlor, was not detected in any of the soil samples across the Estech property. In addition, alpha-BHC, gamma-BHC, and toxaphene were not detected in Area 4 and delta-BHC was not detected in Area 2. If the number of detections within an area were less than four, the maximum detected concentration was

used as the EPC for that constituent. The representative EPCs for each of the four areas and the 16 constituents detected are listed in Table HH-1.

As a next step, the EPCs for each constituent within each of the 4 EDs, called Areas 1 through Area 4 in this document, were compared to the RRS, which includes both the commercial/industrial worker and the construction worker. Table HH-2 shows the constituents that exceed the highest of the Type 1 through 4 surface soil RRS. These include the following:

- Area 1 – arsenic and lead
- Area 2 – no constituents
- Area 3 – lead and 4,4'-DDT
- Area 4 – arsenic and lead

Based on this comparison, Areas 1, 3, and 4 would require corrective action to be protective of construction workers and additional action to be protective of commercial or industrial workers. Arsenic, lead, and 4,4'-DDT are the three primary human health constituents of concern (COCs).

An additional comparison was completed by comparing the highest of the Type 1 through Type 3 surface soil RRS, which does not include the construction worker, to assess if additional constituents would require remediation in order to be protective of industrial or commercial workers. Based on this comparison, additional human health COCs were identified:

- Area 1 – arsenic, lead, beta-BHC, and 4,4'-DDT
- Area 2 – arsenic, lead, beta-BHC, dieldrin, and heptachlor
- Area 3 – arsenic, lead, beta-BHC, 4,4'-DDT, dieldrin, and heptachlor
- Area 4 – arsenic, lead, 4,4'-DDT, and dieldrin

Based on this comparison, beta-BHC, dieldrin, and heptachlor are secondary human health COCs. However, in some instances, the distribution of these constituents is very limited with only one or two sample points within the ED causing the EPC to exceed the Type 3 RRS.

The third step was to identify the sampling points that were associated with higher concentrations of COCs and were contributing the majority of the risk as assessed by comparison of the EPCs to the RRS. This step was accomplished by sorting the data sets from low to high concentrations. The high concentrations were systematically removed and UCLs (or means for lead) were recalculated repeatedly until the EPC was less than the targeted RRS. This process allows for the identification of the most contaminated sample locations, which can be targeted in a Type 5 soil corrective action.

The following table lists the COCs, Goals for Type 4 (construction) and Type 3 (commercial or industrial), and number of samples associated with the calculated EPC exceedance of RRS for each Area:

Area	COC	EPC Goal for Type 4, mg/kg	Number of Associated Samples	EPC Goal for Type 3, mg/kg	Number of Associated Samples
Area 1	Arsenic	190	5 – F3, D5, D4, E8, E11	38	26 – majority of the area
Area 1	Lead	600	20 samples	400	26 – majority of the area
Area 1	Beta-BHC			5.1	1 - F4
Area 1	4,4'-DDT			27	1 - F4
Area 2	Arsenic			38	4 - E13, D18, F13, D12

Area	COC	EPC Goal for Type 4, mg/kg	Number of Associated Samples	EPC Goal for Type 3, mg/kg	Number of Associated Samples
Area 2	Lead			400	2 - D18, E13
Area 2	Beta-BHC			5.1	1 - D17
Area 2	Dieldrin			0.66	3 – D17, D18, D19
Area 2	Heptachlor			2.0	3 – D17, D18, D19
Area 3	Arsenic			38	11 - E25, F26, F25, D22, E21, D20, C21, C20, C22, C23, E23
Area 3	Lead	600	3 - E25, F26, F25	400	8 - E25, F26, F25, D22, E21, D20, C21, C20
Area 3	4,4'-DDT	310	2 - C20, E25	27	2-C20, E25
Area 3	Beta-BHC			5.1	1-C20
Area 3	Dieldrin			0.66	2-C20, E25
Area 3	Heptachlor			2.0	1-C20
Area 4	Arsenic	190	1 - D26	38	5 – D26, C27, D28, E27, C26
Area 4	Lead	600	3 – E27, D28, D26	400	6 - E27, D28, D26, D27, C27, F28
Area 4	4,4'-DDT			27	1- E33
Area 4	Dieldrin			0.66	2 – F29, E33

CONCLUSIONS

Figure HH2 was prepared that outlines the samples in each Area that should be included in designing the corrective action. In summary, the corrective action will be designed to limit exposure in each Area:

- Area 1 - 26 locations
- Area 2 – 6 locations
- Area 3 – 14 locations
- Area 4 – 11 locations

The UCL calculations were repeated after removing concentrations for the six COCs paired with the target sample locations presented in Figure HH2. These calculations document that the post-corrective action EPCs will be less than the RRS. The post-corrective action UCLs for each Area and for the whole site are presented in Attachment B and C, respectively. Table HH-3 summarizes these data. After corrective action, the surface soil UCL concentrations for 4,4'-DDT, arsenic, beta-BHC, and heptachlor will comply with Type 3 RRS. Surface soil mean concentrations for lead will comply with Type 3 RRS. For Area 2 and 3 EPCs, dieldrin will comply with Type 3 RRS. One sample in Area 1 at a concentration of 2.1 mg/kg and one sample in Area 4 at a concentration of 1.1 mg/kg would exceed the Type 3 RRS for dieldrin of 0.66 mg/kg. However, the site as a whole would have a UCL EPC of 0.22 mg/kg and would comply with Type 3 RRS. Regardless, dieldrin in all areas will comply with a Type 4 RRS of 27 mg/kg.

Tables

Table HH-1
Summary for Exposure Point Concentrations for Human Health Exposure Domains Areas 1 through 4
Former Estech Chemical Site
Atlanta, GA

	Surface Soil Upper Confidence Limits[1] (mg/kg)																
Area	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	Arsenic	beta-BHC	Copper	delta-BHC	Dieldrin	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Lead Mean	Methoxychlor	Toxaphene	Zinc
1	2.37	1.239	44.13	0.0515	0.0516	448.4	15.02	607	1.9	0.574	0.159	0.113	0.047	4055	ND	5.394	1539
2	0.356	0.816	21.38	0.0726	1.923	91.9	5.88	293	ND	4.33	0.44	2.904	4.279	531	ND	3.93	1122
3	5.774	4.13	410.8	0.14	4.742	111.1	11.87	287	0.17	6.178	0.15	14.66	41	1119	ND	1.4	555.4
4	2.003	0.323	73.48	ND	0.6	240	0.0624	186	0.024	15	ND	0.56	0.37	4745	ND	ND	590

Notes:

[1] Calculated using ProUCL. Greater than 3 detections required for UCL selection. Lognormal H-UCL not used per notes in the output. No GROS UCLs selected if NDs > 50%. Mean concentrations for lead per USEPA lead exposure modeling.

Highlighted cells indicate that maximum detect concentration was used because there was a limited number of detections (i.e., <4), increasing uncertainty in the UCL.

ND Not Detected

Prepared by/Date: IMR 06/11/2018
Checked by/Date: LO 06/12/2018
Revised by/Date: LMS 06/12/2018

Table HH-2
Comparison of Surface Soil Exposure Point Concentrations to Risk Reduction Standards (Estech Property)
Former Estech Chemical Site
Atlanta, GA

CONSTITUENT	Area 1 UCLs	Area 1 Concentration > Max Surface Soil RRS	Area 2 UCLs	Area 2 Concentration > Max Surface Soil RRS	Area 3 UCLs	Area 3 Concentration > Max Surface Soil RRS	Area 4 UCLs	Area 4 Concentration > Max Surface Soil RRS	Type 1 Soil RRS (mg/kg)	Type 2 Soil RRS (mg/kg)	Type 3 Surface Soil RRS (mg/kg)	Type 4 CW Surface Soil RRS (mg/kg)	Type 1, Type 2, and Type 3 Maximum Onsite Surface Soil RRS (a) (mg/kg)	Type 1, Type 2, Type 3, and Type 4 Maximum Onsite Surface Soil RRS (b) (mg/kg)
INORGANICS/METALS, mg/kg														
Arsenic	**448**	**Yes**	92	No	111	No	**240**	**Yes**	2.0E+01	6.1E+00	3.8E+01	1.9E+02	38	190
Copper	607	No	293	No	287	No	186	No	1.0E+02	3.1E+03	1.5E+03	2.5E+04	3100	25000
Lead	**4055**	**Yes**	531	No	**1119**	**Yes**	**4745**	**Yes**	7.5E+01	3.3E+02	4.0E+02	6.0E+02	400	600
Zinc	1539	No	1122	No	555	No	590	No	1.0E+02	2.3E+04	2.8E+03	1.9E+05	23000	190000
PESTICIDES, mg/kg														
alpha-BHC	0.052	No	0.073	No	0.14	No	ND	No	6.6E-01	1.4E+00	6.6E-01	6.9E+01	1.4	69
beta-BHC	15	No	5.9	No	12	No	0.062	No	6.6E-01	5.1E+00	6.6E-01	2.4E+02	5.1	241
delta-BHC	1.9	No	ND	No	0.17	No	0.024	No	2.5E+01	5.1E+00	2.5E+01	2.4E+02	25	241
gamma-BHC (Lindane)	0.16	No	0.44	No	0.15	No	ND	No	6.6E-01	8.3E+00	6.6E-01	1.9E+02	8.3	186
alpha-Chlordane	0.052	No	1.9	No	4.7	No	0.60	No	9.2E+00	2.6E+01	9.2E+00	3.1E+02	26	310
gamma-Chlordane	0.11	No	2.9	No	15	No	0.56	No	9.2E+00	2.6E+01	9.2E+00	3.1E+02	26	310
DDD	2.4	No	0.36	No	5.8	No	2.0	No	6.6E-01	3.8E+01	6.6E-01	1.8E+03	38	1807
DDE	1.2	No	0.82	No	4.1	No	0.32	No	6.6E-01	2.7E+01	6.6E-01	1.3E+03	27	1275
DDT	44	No	21	No	**411**	**Yes**	73	No	6.6E-01	2.7E+01	6.6E-01	3.1E+02	27	310
Dieldrin	0.57	No	4.3	No	6.2	No	15	No	6.6E-01	5.7E-01	6.6E-01	2.7E+01	0.66	27
Heptachlor	0.047	No	4.3	No	41	No	0.37	No	6.6E-01	2.0E+00	6.6E-01	9.6E+01	2.0	96
Methoxychlor	ND	No	ND	No	ND	No	ND	No	1.0E+01	3.9E+02	1.0E+01	3.1E+03	391	3097
Toxaphene	5.4	No	3.9	No	1.4	No	ND	No	1.1E+01	8.3E+00	1.1E+01	3.9E+02	11	394

(a) Maximum of Type 1, Type 2, and Type 3 surface soil RRS
(b) Maximum of Type 1, Type 2, and Type 3 and Type 4 CW surface soil RRS
Bold values exceed maximum of Type 1, Type 2, Type 3, and Type 4 construction worker surface soil RRS
Values in red exceed maximum of Type 1, Type 2, and Type 3 RRS.

Prepared by: LMS 6/15/18
Checked by: IMR 06/25/2018

Table HH-3
Comparison of Post Corrective Action Surface Soil Exposure Point Concentrations to Risk Reduction Standards
Former Estech Chemical Site
Atlanta, GA

CONSTITUENT		Area 1 Revised UCLs	Area 1 Concentration > Max Surface Soil RRS	Area 2 Revised UCLs	Area 2 Concentration > Max Surface Soil RRS	Area 3 Revised UCLs	Area 3 Concentration > Max Surface Soil RRS	Area 4 Revised UCLs	Area 4 Concentration > Max Surface Soil RRS	Type 1, Type 2, and Type 3 Maximum Onsite Surface Soil RRS (a) (mg/kg)	Type 1, Type 2, Type 3, and Type 4 Maximum Onsite Surface Soil RRS (b) (mg/kg)
INORGANICS/METALS, mg/kg											
Arsenic		37.54	No	34.02	No	33.5	No	31.02	No	38	190
Lead		298.1	No	336.5	No	285.7	No	270.9	No	400	600
PESTICIDES, mg/kg											
beta-BHC		0.258	No	0.396	No	0.055	No	0.0643	No	5.1	241
DDT		4.938	No	2.825	No	6.804	No	24.83	No	27	310
Dieldrin		0.908	Yes	0.314	No	0.0874	No	0.322	No	0.66	27
Heptachlor		ND	No	0.14	No	0.13	No	0.17	No	2.0	96

(a) Maximum of Type 1, Type 2, and Type 3 surface soil RRS
(b) Maximum of Type 1, Type 2, and Type 3 and Type 4 CW surface soil RRS
Value in red exceeds maximum of Type 1, Type 2, and Type 3 RRS.
ND = Non-detect

Prepared By/Date: IMR 07/03/2018
Checked By/Date: NSR 07/06/18

Figures

Former Estech General Chemical Site
Atlanta, Georgia

Sampling Locations used in Human Health Comparison to RRS (2018 Soil Samples)

Prepared by/Date: JRM - 7/31/2018	wood.	Figure Number: HH-1
Checked by/Date: LO - 7/31/2018		
Project Number: 6122080154		

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N
W
E
S

H01
H02
H03
H04

D1 E2 F3
D2 E3 F4
D3 E4 F5
C3 D4 E5 F6
C4 D5 E6 F7
C5 D6 E7 F8
C6 D7 E8 F9
C7 D8 E9 F10
C8 D9 E10 F11
C9 D10 E11 F12
C10 D11 E12 F13
B10 C11 D12 E13 F14
B11 C12 D13 E14 F15
B12 C13 D14 E15 F16
C14 D15 E16 F17
C15 D16 E17 F18
C16 D17 E18 F19
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A26 B27 C28 D29 E30 F31
B28 C29 D30 E31 F32
B29 C30 D31 E32
C31 D32 E33
C32 D33 E34
D34 E35

Legend

- 2018 Soil Location
- Exposure Areas for Human Health Comparison to RRS
- Yellow Area of Corrective Action
- Orange Area of Corrective Action
- Red Area of Corrective Action
- Green Area of Corrective Action
- Purple Area of Corrective Action

0 200 400 Feet

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Former Estech General Chemical Site
Atlanta, Georgia

Human Health Comparison to RRS (2018 Soil Samples) - Areas of Corrective Action

Prepared by/Date: JRM - 7/31/2018	wood.	**Figure Number: HH-2**
Checked by/Date: LO - 7/31/2018		
Project Number: 6122080154		

ATTACHMENT A

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/8/2018 1:59:07 PM
From File	BFEL Grouped ProUCL Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	27
Number of Detects	12	Number of Non-Detects	24
Number of Distinct Detects	10	Number of Distinct Non-Detects	18
Minimum Detect	0.072	Minimum Non-Detect	0.024
Maximum Detect	15	Maximum Non-Detect	0.5
Variance Detects	18.27	Percent Non-Detects	66.67%
Mean Detects	1.434	SD Detects	4.274
Median Detects	0.145	CV Detects	2.98
Skewness Detects	3.458	Kurtosis Detects	11.97
Mean of Logged Detects	-1.423	SD of Logged Detects	1.439

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.352	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.507	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	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

KM Mean	0.51	KM Standard Error of Mean	0.427
KM SD	2.452	95% KM (BCA) UCL	1.375
95% KM (t) UCL	1.231	95% KM (Percentile Bootstrap) UCL	1.333
95% KM (z) UCL	1.212	95% KM Bootstrap t UCL	12.41
90% KM Chebyshev UCL	1.79	95% KM Chebyshev UCL	2.37
97.5% KM Chebyshev UCL	3.175	99% KM Chebyshev UCL	4.757

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.583	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.81	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.423	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.263	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)	0.373	k star (bias corrected MLE)	0.335
Theta hat (MLE)	3.845	Theta star (bias corrected MLE)	4.277
nu hat (MLE)	8.953	nu star (bias corrected)	8.048
Mean (detects)	1.434		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.485
Maximum	15	Median	0.01
SD	2.491	CV	5.139
k hat (MLE)	0.252	k star (bias corrected MLE)	0.249
Theta hat (MLE)	1.927	Theta star (bias corrected MLE)	1.946
nu hat (MLE)	18.11	nu star (bias corrected)	17.94
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (17.94, α)	9.346	Adjusted Chi Square Value (17.94, β)	9.064
95% Gamma Approximate UCL (use when n>=50)	0.93	95% Gamma Adjusted UCL (use when n<50)	0.959

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.51	SD (KM)	2.452
Variance (KM)	6.01	SE of Mean (KM)	0.427
k hat (KM)	0.0432	k star (KM)	0.0582
nu hat (KM)	3.113	nu star (KM)	4.187
theta hat (KM)	11.79	theta star (KM)	8.766
80% gamma percentile (KM)	0.112	90% gamma percentile (KM)	0.929
95% gamma percentile (KM)	2.837	99% gamma percentile (KM)	10.42

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.19, α)	0.797	Adjusted Chi Square Value (4.19, β)	0.735
95% Gamma Approximate KM-UCL (use when n>=50)	2.678	95% Gamma Adjusted KM-UCL (use when n<50)	2.905

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.717	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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	0.492	Mean in Log Scale	-3.23
SD in Original Scale	2.49	SD in Log Scale	1.632
95% t UCL (assumes normality of ROS data)	1.193	95% Percentile Bootstrap UCL	1.318
95% BCA Bootstrap UCL	1.755	95% Bootstrap t UCL	13.71
95% H-UCL (Log ROS)	0.362		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.693	KM Geo Mean	0.0677
KM SD (logged)	1.318	95% Critical H Value (KM-Log)	2.768
KM Standard Error of Mean (logged)	0.26	95% H-UCL (KM -Log)	0.299
KM SD (logged)	1.318	95% Critical H Value (KM-Log)	2.768
KM Standard Error of Mean (logged)	0.26		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.533	Mean in Log Scale	-2.336
SD in Original Scale	2.482	SD in Log Scale	1.236
95% t UCL (Assumes normality)	1.232	95% H-Stat UCL	0.362

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 (Chebyshev) UCL 2.37

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

4,4'-DDD (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	26
Number of Detects	7	Number of Non-Detects	29
Number of Distinct Detects	6	Number of Distinct Non-Detects	22
Minimum Detect	0.22	Minimum Non-Detect	0.0041
Maximum Detect	2.5	Maximum Non-Detect	7.6
Variance Detects	0.689	Percent Non-Detects	80.56%
Mean Detects	0.631	SD Detects	0.83
Median Detects	0.37	CV Detects	1.314
Skewness Detects	2.567	Kurtosis Detects	6.679
Mean of Logged Detects	-0.887	SD of Logged Detects	0.853

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.559	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.43	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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

KM Mean	0.148	KM Standard Error of Mean	0.081
KM SD	0.432	95% KM (BCA) UCL	0.304
95% KM (t) UCL	0.284	95% KM (Percentile Bootstrap) UCL	0.29
95% KM (z) UCL	0.281	95% KM Bootstrap t UCL	0.43
90% KM Chebyshev UCL	0.39	95% KM Chebyshev UCL	0.5
97.5% KM Chebyshev UCL	0.653	99% KM Chebyshev UCL	0.953

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.105	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.724	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.357	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.318	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)	1.313	k star (bias corrected MLE)	0.845
Theta hat (MLE)	0.481	Theta star (bias corrected MLE)	0.747
nu hat (MLE)	18.38	nu star (bias corrected)	11.84
Mean (detects)	0.631		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.131
Maximum	2.5	Median	0.01
SD	0.425	CV	3.245
k hat (MLE)	0.362	k star (bias corrected MLE)	0.35
Theta hat (MLE)	0.362	Theta star (bias corrected MLE)	0.374
nu hat (MLE)	26.05	nu star (bias corrected)	25.22
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (25.22, α)	14.78	Adjusted Chi Square Value (25.22, β)	14.41
95% Gamma Approximate UCL (use when n>=50)	0.223	95% Gamma Adjusted UCL (use when n<50)	0.229

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.148	SD (KM)	0.432
Variance (KM)	0.186	SE of Mean (KM)	0.081
k hat (KM)	0.117	k star (KM)	0.126
nu hat (KM)	8.422	nu star (KM)	9.053
theta hat (KM)	1.262	theta star (KM)	1.174
80% gamma percentile (KM)	0.136	90% gamma percentile (KM)	0.423
95% gamma percentile (KM)	0.837	99% gamma percentile (KM)	2.086

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.05, α)	3.359	Adjusted Chi Square Value (9.05, β)	3.203
95% Gamma Approximate KM-UCL (use when n>=50)	0.398	95% Gamma Adjusted KM-UCL (use when n<50)	0.417

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.753	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.286	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	Detected Data appear 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	0.155	Mean in Log Scale	-2.852
SD in Original Scale	0.418	SD in Log Scale	1.13
95% t UCL (assumes normality of ROS data)	0.273	95% Percentile Bootstrap UCL	0.282
95% BCA Bootstrap UCL	0.369	95% Bootstrap t UCL	0.576
95% H-UCL (Log ROS)	0.177		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.333	KM Geo Mean	0.0131
KM SD (logged)	2.014	95% Critical H Value (KM-Log)	3.736
KM Standard Error of Mean (logged)	0.416	95% H-UCL (KM -Log)	0.356
KM SD (logged)	2.014	95% Critical H Value (KM-Log)	3.736
KM Standard Error of Mean (logged)	0.416		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.358	Mean in Log Scale	-2.382
SD in Original Scale	0.793	SD in Log Scale	1.691
95% t UCL (Assumes normality)	0.581	95% H-Stat UCL	0.983

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.356

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'-DDD (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	28
Number of Detects	13	Number of Non-Detects	23
Number of Distinct Detects	13	Number of Distinct Non-Detects	15
Minimum Detect	0.051	Minimum Non-Detect	0.0043
Maximum Detect	27	Maximum Non-Detect	0.49
Variance Detects	82.14	Percent Non-Detects	63.89%
Mean Detects	4.225	SD Detects	9.063
Median Detects	0.73	CV Detects	2.145
Skewness Detects	2.23	Kurtosis Detects	3.654
Mean of Logged Detects	-0.464	SD of Logged Detects	1.989

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.499	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.481	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.234	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.531	KM Standard Error of Mean	0.973
KM SD	5.611	95% KM (BCA) UCL	3.483
95% KM (t) UCL	3.176	95% KM (Percentile Bootstrap) UCL	3.213
95% KM (z) UCL	3.132	95% KM Bootstrap t UCL	25.6
90% KM Chebyshev UCL	4.451	95% KM Chebyshev UCL	5.774
97.5% KM Chebyshev UCL	7.61	99% KM Chebyshev UCL	11.22

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.532	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.819	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.374	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.255	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)	0.353	k star (bias corrected MLE)	0.323
Theta hat (MLE)	11.98	Theta star (bias corrected MLE)	13.1
nu hat (MLE)	9.167	nu star (bias corrected)	8.385
Mean (detects)	4.225		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.532
Maximum	27	Median	0.01
SD	5.69	CV	3.714
k hat (MLE)	0.207	k star (bias corrected MLE)	0.208
Theta hat (MLE)	7.403	Theta star (bias corrected MLE)	7.358
nu hat (MLE)	14.9	nu star (bias corrected)	14.99
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (14.99, α)	7.258	Adjusted Chi Square Value (14.99, β)	7.013
95% Gamma Approximate UCL (use when n>=50)	3.166	95% Gamma Adjusted UCL (use when n<50)	3.276

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.531	SD (KM)	5.611
Variance (KM)	31.48	SE of Mean (KM)	0.973
k hat (KM)	0.0745	k star (KM)	0.0868
nu hat (KM)	5.363	nu star (KM)	6.25
theta hat (KM)	20.56	theta star (KM)	17.64
80% gamma percentile (KM)	0.848	90% gamma percentile (KM)	3.809
95% gamma percentile (KM)	8.923	99% gamma percentile (KM)	26.08

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.25, α)	1.769	Adjusted Chi Square Value (6.25, β)	1.663
95% Gamma Approximate KM-UCL (use when n>=50)	5.411	95% Gamma Adjusted KM-UCL (use when n<50)	5.755

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.235	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.234	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	1.529	Mean in Log Scale	-4.047
SD in Original Scale	5.691	SD in Log Scale	3.111
95% t UCL (assumes normality of ROS data)	3.131	95% Percentile Bootstrap UCL	3.107
95% BCA Bootstrap UCL	4.246	95% Bootstrap t UCL	25.9
95% H-UCL (Log ROS)	38		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.53	KM Geo Mean	0.0293
KM SD (logged)	2.634	95% Critical H Value (KM-Log)	4.667
KM Standard Error of Mean (logged)	0.469	95% H-UCL (KM -Log)	7.518
KM SD (logged)	2.634	95% Critical H Value (KM-Log)	4.667
KM Standard Error of Mean (logged)	0.469		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.563	Mean in Log Scale	-2.5
SD in Original Scale	5.682	SD in Log Scale	2.231
95% t UCL (Assumes normality)	3.163	95% H-Stat UCL	4.566

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5.774

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'-DDD (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	28
Number of Detects	4	Number of Non-Detects	32
Number of Distinct Detects	4	Number of Distinct Non-Detects	25
Minimum Detect	0.27	Minimum Non-Detect	0.0041
Maximum Detect	10	Maximum Non-Detect	4.5
Variance Detects	22.59	Percent Non-Detects	88.89%
Mean Detects	2.878	SD Detects	4.753
Median Detects	0.62	CV Detects	1.652
Skewness Detects	1.989	Kurtosis Detects	3.962
Mean of Logged Detects	-0.00578	SD of Logged Detects	1.597

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.67	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.421	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.327	KM Standard Error of Mean	0.316
KM SD	1.642	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.861	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.847	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.275	95% KM Chebyshev UCL	1.705
97.5% KM Chebyshev UCL	2.301	99% KM Chebyshev UCL	3.472

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.603	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.677	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.391	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.408	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma Statistics on Detected Data Only

k hat (MLE)	0.584	k star (bias corrected MLE)	0.313
Theta hat (MLE)	4.929	Theta star (bias corrected MLE)	9.205
nu hat (MLE)	4.67	nu star (bias corrected)	2.501
Mean (detects)	2.878		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.329
Maximum	10	Median	0.01
SD	1.665	CV	5.066
k hat (MLE)	0.24	k star (bias corrected MLE)	0.238
Theta hat (MLE)	1.37	Theta star (bias corrected MLE)	1.379
nu hat (MLE)	17.27	nu star (bias corrected)	17.16
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (17.16, α)	8.789	Adjusted Chi Square Value (17.16, β)	8.516
95% Gamma Approximate UCL (use when n>=50)	0.642	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.327	SD (KM)	1.642
Variance (KM)	2.697	SE of Mean (KM)	0.316
k hat (KM)	0.0396	k star (KM)	0.0548
nu hat (KM)	2.852	nu star (KM)	3.947
theta hat (KM)	8.252	theta star (KM)	5.962
80% gamma percentile (KM)	0.0603	90% gamma percentile (KM)	0.558
95% gamma percentile (KM)	1.791	99% gamma percentile (KM)	6.849

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.95, α)	0.701	Adjusted Chi Square Value (3.95, β)	0.644
95% Gamma Approximate KM-UCL (use when n>=50)	1.84	95% Gamma Adjusted KM-UCL (use when n<50)	2.003

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.314	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.321	Mean in Log Scale	-6.174
SD in Original Scale	1.666	SD in Log Scale	2.466
95% t UCL (assumes normality of ROS data)	0.79	95% Percentile Bootstrap UCL	0.869
95% BCA Bootstrap UCL	1.403	95% Bootstrap t UCL	6.865
95% H-UCL (Log ROS)	0.274		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.844	KM Geo Mean	0.00787
KM SD (logged)	1.824	95% Critical H Value (KM-Log)	3.46
KM Standard Error of Mean (logged)	0.362	95% H-UCL (KM -Log)	0.121
KM SD (logged)	1.824	95% Critical H Value (KM-Log)	3.46
KM Standard Error of Mean (logged)	0.362		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.424	Mean in Log Scale	-3.5
SD in Original Scale	1.688	SD in Log Scale	2.063
95% t UCL (Assumes normality)	0.899	95% H-Stat UCL	0.956

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

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Suggested UCL to Use

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	2.003

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'-DDE (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	31
Number of Detects	31	Number of Non-Detects	5
Number of Distinct Detects	28	Number of Distinct Non-Detects	4
Minimum Detect	0.074	Minimum Non-Detect	0.038
Maximum Detect	5.9	Maximum Non-Detect	0.42
Variance Detects	1.286	Percent Non-Detects	13.89%
Mean Detects	0.904	SD Detects	1.134
Median Detects	0.5	CV Detects	1.255
Skewness Detects	3.223	Kurtosis Detects	12.52
Mean of Logged Detects	-0.574	SD of Logged Detects	0.959

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.635	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.929	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.156	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

KM Mean	0.792	KM Standard Error of Mean	0.182
KM SD	1.073	95% KM (BCA) UCL	1.157
95% KM (t) UCL	1.099	95% KM (Percentile Bootstrap) UCL	1.106
95% KM (z) UCL	1.091	95% KM Bootstrap t UCL	1.346
90% KM Chebyshev UCL	1.337	95% KM Chebyshev UCL	1.584
97.5% KM Chebyshev UCL	1.927	99% KM Chebyshev UCL	2.601

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.84	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.771	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.156	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.162	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.195	k star (bias corrected MLE)	1.101
Theta hat (MLE)	0.756	Theta star (bias corrected MLE)	0.821
nu hat (MLE)	74.1	nu star (bias corrected)	68.26
Mean (detects)	0.904		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.78
Maximum	5.9	Median	0.43
SD	1.096	CV	1.405
k hat (MLE)	0.685	k star (bias corrected MLE)	0.646
Theta hat (MLE)	1.139	Theta star (bias corrected MLE)	1.207
nu hat (MLE)	49.29	nu star (bias corrected)	46.52
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (46.52, α)	31.87	Adjusted Chi Square Value (46.52, β)	31.31
95% Gamma Approximate UCL (use when n>=50)	1.138	95% Gamma Adjusted UCL (use when n<50)	1.158

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.792	SD (KM)	1.073
Variance (KM)	1.151	SE of Mean (KM)	0.182
k hat (KM)	0.545	k star (KM)	0.518
nu hat (KM)	39.21	nu star (KM)	37.28
theta hat (KM)	1.454	theta star (KM)	1.529
80% gamma percentile (KM)	1.302	90% gamma percentile (KM)	2.127
95% gamma percentile (KM)	3.004	99% gamma percentile (KM)	5.155

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (37.28, α)	24.3	Adjusted Chi Square Value (37.28, β)	23.82
95% Gamma Approximate KM-UCL (use when n>=50)	1.215	95% Gamma Adjusted KM-UCL (use when n<50)	1.239

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.986	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.929	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0953	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.156	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	0.793	Mean in Log Scale	-0.826
SD in Original Scale	1.087	SD in Log Scale	1.108
95% t UCL (assumes normality of ROS data)	1.099	95% Percentile Bootstrap UCL	1.122
95% BCA Bootstrap UCL	1.247	95% Bootstrap t UCL	1.356
95% H-UCL (Log ROS)	1.293		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.866	KM Geo Mean	0.421
KM SD (logged)	1.173	95% Critical H Value (KM-Log)	2.586
KM Standard Error of Mean (logged)	0.202	95% H-UCL (KM -Log)	1.396
KM SD (logged)	1.173	95% Critical H Value (KM-Log)	2.586
KM Standard Error of Mean (logged)	0.202		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.791	Mean in Log Scale	-0.88
SD in Original Scale	1.088	SD in Log Scale	1.231
95% t UCL (Assumes normality)	1.098	95% H-Stat UCL	1.538

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Adjusted Gamma UCL	1.239	95% GROS Adjusted Gamma UCL	1.158

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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'-DDE (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	33
Number of Detects	28	Number of Non-Detects	8
Number of Distinct Detects	25	Number of Distinct Non-Detects	8
Minimum Detect	0.036	Minimum Non-Detect	0.024
Maximum Detect	2.4	Maximum Non-Detect	7.6
Variance Detects	0.445	Percent Non-Detects	22.22%
Mean Detects	0.746	SD Detects	0.667
Median Detects	0.64	CV Detects	0.894
Skewness Detects	1.092	Kurtosis Detects	0.628
Mean of Logged Detects	-0.805	SD of Logged Detects	1.159

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.924	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.144	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.164	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

KM Mean	0.624	KM Standard Error of Mean	0.114
KM SD	0.65	95% KM (BCA) UCL	0.817
95% KM (t) UCL	0.816	95% KM (Percentile Bootstrap) UCL	0.806
95% KM (z) UCL	0.811	95% KM Bootstrap t UCL	0.864
90% KM Chebyshev UCL	0.965	95% KM Chebyshev UCL	1.12
97.5% KM Chebyshev UCL	1.334	99% KM Chebyshev UCL	1.755

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.499	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.771	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.137	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.17	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)	1.115	k star (bias corrected MLE)	1.02
Theta hat (MLE)	0.669	Theta star (bias corrected MLE)	0.731
nu hat (MLE)	62.45	nu star (bias corrected)	57.09
Mean (detects)	0.746		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.609
Maximum	2.4	Median	0.417
SD	0.645	CV	1.059
k hat (MLE)	0.73	k star (bias corrected MLE)	0.688
Theta hat (MLE)	0.834	Theta star (bias corrected MLE)	0.886
nu hat (MLE)	52.58	nu star (bias corrected)	49.54
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (49.54, α)	34.38	Adjusted Chi Square Value (49.54, β)	33.8
95% Gamma Approximate UCL (use when n>=50)	0.878	95% Gamma Adjusted UCL (use when n<50)	0.893

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.624	SD (KM)	0.65
Variance (KM)	0.423	SE of Mean (KM)	0.114
k hat (KM)	0.922	k star (KM)	0.864
nu hat (KM)	66.4	nu star (KM)	62.2
theta hat (KM)	0.677	theta star (KM)	0.723
80% gamma percentile (KM)	1.016	90% gamma percentile (KM)	1.49
95% gamma percentile (KM)	1.97	99% gamma percentile (KM)	3.097

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (62.20, α)	45.06	Adjusted Chi Square Value (62.20, β)	44.4
95% Gamma Approximate KM-UCL (use when n>=50)	0.862	95% Gamma Adjusted KM-UCL (use when n<50)	0.875

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.924	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.159	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.164	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	0.608	Mean in Log Scale	-1.178
SD in Original Scale	0.644	SD in Log Scale	1.312
95% t UCL (assumes normality of ROS data)	0.789	95% Percentile Bootstrap UCL	0.794
95% BCA Bootstrap UCL	0.81	95% Bootstrap t UCL	0.821
95% H-UCL (Log ROS)	1.343		

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.229	KM Geo Mean	0.293
KM SD (logged)	1.415	95% Critical H Value (KM-Log)	2.894
KM Standard Error of Mean (logged)	0.251	95% H-UCL (KM -Log)	1.59
KM SD (logged)	1.415	95% Critical H Value (KM-Log)	2.894
KM Standard Error of Mean (logged)	0.251		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.761	Mean in Log Scale	-1.072
SD in Original Scale	0.863	SD in Log Scale	1.493
95% t UCL (Assumes normality)	1.005	95% H-Stat UCL	2.225

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 0.816

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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'-DDE (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	32
Number of Detects	22	Number of Non-Detects	14
Number of Distinct Detects	21	Number of Distinct Non-Detects	12
Minimum Detect	0.055	Minimum Non-Detect	0.0048
Maximum Detect	25	Maximum Non-Detect	4.5
Variance Detects	27.48	Percent Non-Detects	38.89%
Mean Detects	1.745	SD Detects	5.242
Median Detects	0.455	CV Detects	3.005
Skewness Detects	4.555	Kurtosis Detects	21.09
Mean of Logged Detects	-0.939	SD of Logged Detects	1.57

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.32	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.42	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.184	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

KM Mean	1.088	KM Standard Error of Mean	0.698
KM SD	4.089	95% KM (BCA) UCL	2.529
95% KM (t) UCL	2.267	95% KM (Percentile Bootstrap) UCL	2.431
95% KM (z) UCL	2.236	95% KM Bootstrap t UCL	8.538
90% KM Chebyshev UCL	3.181	95% KM Chebyshev UCL	4.13
97.5% KM Chebyshev UCL	5.446	99% KM Chebyshev UCL	8.031

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.824	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.819	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.234	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.198	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)	0.434	k star (bias corrected MLE)	0.405
Theta hat (MLE)	4.018	Theta star (bias corrected MLE)	4.305
nu hat (MLE)	19.1	nu star (bias corrected)	17.83
Mean (detects)	1.745		

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.07
Maximum	25	Median	0.0695
SD	4.15	CV	3.878
k hat (MLE)	0.286	k star (bias corrected MLE)	0.28
Theta hat (MLE)	3.745	Theta star (bias corrected MLE)	3.816
nu hat (MLE)	20.57	nu star (bias corrected)	20.19
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (20.19, α)	10.99	Adjusted Chi Square Value (20.19, β)	10.68
95% Gamma Approximate UCL (use when n>=50)	1.966	95% Gamma Adjusted UCL (use when n<50)	2.022

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.088	SD (KM)	4.089
Variance (KM)	16.72	SE of Mean (KM)	0.698
k hat (KM)	0.0707	k star (KM)	0.0834
nu hat (KM)	5.093	nu star (KM)	6.002
theta hat (KM)	15.38	theta star (KM)	13.05
80% gamma percentile (KM)	0.56	90% gamma percentile (KM)	2.644
95% gamma percentile (KM)	6.334	99% gamma percentile (KM)	18.89

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.00, α)	1.641	Adjusted Chi Square Value (6.00, β)	1.54
95% Gamma Approximate KM-UCL (use when n>=50)	3.978	95% Gamma Adjusted KM-UCL (use when n<50)	4.239

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.911	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.126	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.184	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	1.078	Mean in Log Scale	-2.066
SD in Original Scale	4.148	SD in Log Scale	1.95
95% t UCL (assumes normality of ROS data)	2.246	95% Percentile Bootstrap UCL	2.398
95% BCA Bootstrap UCL	3.129	95% Bootstrap t UCL	8.935
95% H-UCL (Log ROS)	2.816		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.315	KM Geo Mean	0.0988
KM SD (logged)	2.287	95% Critical H Value (KM-Log)	4.14
KM Standard Error of Mean (logged)	0.413	95% H-UCL (KM -Log)	6.695
KM SD (logged)	2.287	95% Critical H Value (KM-Log)	4.14
KM Standard Error of Mean (logged)	0.413		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.153	Mean in Log Scale	-1.816
SD in Original Scale	4.145	SD in Log Scale	1.989
95% t UCL (Assumes normality)	2.321	95% H-Stat UCL	4.078

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 (Chebyshev) UCL	4.13

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

4,4'-DDE (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	32
Number of Detects	21	Number of Non-Detects	15
Number of Distinct Detects	19	Number of Distinct Non-Detects	13
Minimum Detect	0.0074	Minimum Non-Detect	0.0041
Maximum Detect	1.3	Maximum Non-Detect	4.2
Variance Detects	0.117	Percent Non-Detects	41.67%
Mean Detects	0.309	SD Detects	0.341
Median Detects	0.18	CV Detects	1.105
Skewness Detects	1.469	Kurtosis Detects	1.991
Mean of Logged Detects	-1.906	SD of Logged Detects	1.413

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.806	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.908	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.188	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

KM Mean	0.194	KM Standard Error of Mean	0.0516
KM SD	0.296	95% KM (BCA) UCL	0.277
95% KM (t) UCL	0.281	95% KM (Percentile Bootstrap) UCL	0.28
95% KM (z) UCL	0.279	95% KM Bootstrap t UCL	0.318
90% KM Chebyshev UCL	0.349	95% KM Chebyshev UCL	0.419
97.5% KM Chebyshev UCL	0.516	99% KM Chebyshev UCL	0.707

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.352	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.78	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.143	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.196	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)	0.809	k star (bias corrected MLE)	0.725
Theta hat (MLE)	0.382	Theta star (bias corrected MLE)	0.426
nu hat (MLE)	33.99	nu star (bias corrected)	30.47
Mean (detects)	0.309		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0074	Mean	0.185
Maximum	1.3	Median	0.0407
SD	0.298	CV	1.606
k hat (MLE)	0.489	k star (bias corrected MLE)	0.466
Theta hat (MLE)	0.38	Theta star (bias corrected MLE)	0.398
nu hat (MLE)	35.18	nu star (bias corrected)	33.58
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (33.58, α)	21.33	Adjusted Chi Square Value (33.58, β)	20.88
95% Gamma Approximate UCL (use when n>=50)	0.292	95% Gamma Adjusted UCL (use when n<50)	0.298

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.194	SD (KM)	0.296
Variance (KM)	0.0877	SE of Mean (KM)	0.0516
k hat (KM)	0.428	k star (KM)	0.411
nu hat (KM)	30.85	nu star (KM)	29.61
theta hat (KM)	0.453	theta star (KM)	0.471
80% gamma percentile (KM)	0.314	90% gamma percentile (KM)	0.545
95% gamma percentile (KM)	0.798	99% gamma percentile (KM)	1.432

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (29.61, α)	18.18	Adjusted Chi Square Value (29.61, β)	17.78
95% Gamma Approximate KM-UCL (use when n>=50)	0.316	95% Gamma Adjusted KM-UCL (use when n<50)	0.323

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.908	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0979	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.188	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	0.187	Mean in Log Scale	-2.986
SD in Original Scale	0.297	SD in Log Scale	1.754
95% t UCL (assumes normality of ROS data)	0.27	95% Percentile Bootstrap UCL	0.27
95% BCA Bootstrap UCL	0.289	95% Bootstrap t UCL	0.305
95% H-UCL (Log ROS)	0.637		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.115	KM Geo Mean	0.0444
KM SD (logged)	1.952	95% Critical H Value (KM-Log)	3.644
KM Standard Error of Mean (logged)	0.354	95% H-UCL (KM -Log)	0.991
KM SD (logged)	1.952	95% Critical H Value (KM-Log)	3.644
KM Standard Error of Mean (logged)	0.354		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.261	Mean in Log Scale	-2.738
SD in Original Scale	0.43	SD in Log Scale	1.981
95% t UCL (Assumes normality)	0.382	95% H-Stat UCL	1.583

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.323

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 (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	32
Number of Detects	33	Number of Non-Detects	3
Number of Distinct Detects	29	Number of Distinct Non-Detects	3
Minimum Detect	0.054	Minimum Non-Detect	0.038
Maximum Detect	280	Maximum Non-Detect	0.21
Variance Detects	2338	Percent Non-Detects	8.333%
Mean Detects	11.37	SD Detects	48.35
Median Detects	1.9	CV Detects	4.254
Skewness Detects	5.698	Kurtosis Detects	32.63
Mean of Logged Detects	0.618	SD of Logged Detects	1.559

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.224	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.434	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	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

KM Mean	10.42	KM Standard Error of Mean	7.733
KM SD	45.69	95% KM (BCA) UCL	26.69
95% KM (t) UCL	23.49	95% KM (Percentile Bootstrap) UCL	25.58
95% KM (z) UCL	23.14	95% KM Bootstrap t UCL	176.3
90% KM Chebyshev UCL	33.62	95% KM Chebyshev UCL	44.13
97.5% KM Chebyshev UCL	58.72	99% KM Chebyshev UCL	87.37

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.236	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.84	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.3	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.165	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)	0.368	k star (bias corrected MLE)	0.355
Theta hat (MLE)	30.89	Theta star (bias corrected MLE)	32.04
nu hat (MLE)	24.29	nu star (bias corrected)	23.41
Mean (detects)	11.37		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	10.42
Maximum	280	Median	1.5
SD	46.34	CV	4.447
k hat (MLE)	0.316	k star (bias corrected MLE)	0.309
Theta hat (MLE)	32.94	Theta star (bias corrected MLE)	33.77
nu hat (MLE)	22.78	nu star (bias corrected)	22.21
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (22.21, α)	12.5	Adjusted Chi Square Value (22.21, β)	12.17
95% Gamma Approximate UCL (use when n>=50)	18.52	95% Gamma Adjusted UCL (use when n<50)	19.02

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.42	SD (KM)	45.69
Variance (KM)	2088	SE of Mean (KM)	7.733
k hat (KM)	0.052	k star (KM)	0.0662
nu hat (KM)	3.746	nu star (KM)	4.768
theta hat (KM)	200.3	theta star (KM)	157.4
80% gamma percentile (KM)	3.267	90% gamma percentile (KM)	21.48
95% gamma percentile (KM)	59.5	99% gamma percentile (KM)	201.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.77, α)	1.046	Adjusted Chi Square Value (4.77, β)	0.971
95% Gamma Approximate KM-UCL (use when n>=50)	47.49	95% Gamma Adjusted KM-UCL (use when n<50)	51.16

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.931	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.152	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	10.42	Mean in Log Scale	0.341
SD in Original Scale	46.34	SD in Log Scale	1.761
95% t UCL (assumes normality of ROS data)	23.47	95% Percentile Bootstrap UCL	25.7
95% BCA Bootstrap UCL	33.9	95% Bootstrap t UCL	174.7
95% H-UCL (Log ROS)	18.05		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.299	KM Geo Mean	1.349
KM SD (logged)	1.811	95% Critical H Value (KM-Log)	3.442
KM Standard Error of Mean (logged)	0.307	95% H-UCL (KM -Log)	19.95
KM SD (logged)	1.811	95% Critical H Value (KM-Log)	3.442
KM Standard Error of Mean (logged)	0.307		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	10.42	Mean in Log Scale	0.287
SD in Original Scale	46.34	SD in Log Scale	1.874
95% t UCL (Assumes normality)	23.47	95% H-Stat UCL	23.61

DL/2 is not a recommended method, provided for comparisons and historical reasons

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL 44.13

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 (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	33
Number of Detects	34	Number of Non-Detects	2
Number of Distinct Detects	31	Number of Distinct Non-Detects	2
Minimum Detect	0.069	Minimum Non-Detect	0.048
Maximum Detect	130	Maximum Non-Detect	43
Variance Detects	488.1	Percent Non-Detects	5.556%
Mean Detects	6.024	SD Detects	22.09
Median Detects	1.35	CV Detects	3.667
Skewness Detects	5.68	Kurtosis Detects	32.76
Mean of Logged Detects	0.126	SD of Logged Detects	1.662

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.26	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.409	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	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

KM Mean	5.752	KM Standard Error of Mean	3.586
KM SD	21.19	95% KM (BCA) UCL	12.65
95% KM (t) UCL	11.81	95% KM (Percentile Bootstrap) UCL	12.74
95% KM (z) UCL	11.65	95% KM Bootstrap t UCL	50.34
90% KM Chebyshev UCL	16.51	95% KM Chebyshev UCL	21.38
97.5% KM Chebyshev UCL	28.14	99% KM Chebyshev UCL	41.43

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.55	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.835	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.216	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.162	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)	0.395	k star (bias corrected MLE)	0.38
Theta hat (MLE)	15.25	Theta star (bias corrected MLE)	15.86
nu hat (MLE)	26.86	nu star (bias corrected)	25.82
Mean (detects)	6.024		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.69
Maximum	130	Median	1.2
SD	21.5	CV	3.778
k hat (MLE)	0.357	k star (bias corrected MLE)	0.346
Theta hat (MLE)	15.92	Theta star (bias corrected MLE)	16.44
nu hat (MLE)	25.73	nu star (bias corrected)	24.92
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (24.92, α)	14.55	Adjusted Chi Square Value (24.92, β)	14.19
95% Gamma Approximate UCL (use when n>=50)	9.745	95% Gamma Adjusted UCL (use when n<50)	9.993

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.752	SD (KM)	21.19
Variance (KM)	449	SE of Mean (KM)	3.586
k hat (KM)	0.0737	k star (KM)	0.0861
nu hat (KM)	5.306	nu star (KM)	6.197
theta hat (KM)	78.06	theta star (KM)	66.83
80% gamma percentile (KM)	3.136	90% gamma percentile (KM)	14.24
95% gamma percentile (KM)	33.51	99% gamma percentile (KM)	98.37

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.20, α)	1.741	Adjusted Chi Square Value (6.20, β)	1.637
95% Gamma Approximate KM-UCL (use when n>=50)	20.47	95% Gamma Adjusted KM-UCL (use when n<50)	21.78

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.112	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	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	5.716	Mean in Log Scale	0.00696
SD in Original Scale	21.49	SD in Log Scale	1.753
95% t UCL (assumes normality of ROS data)	11.77	95% Percentile Bootstrap UCL	12.72
95% BCA Bootstrap UCL	16.92	95% Bootstrap t UCL	50.63
95% H-UCL (Log ROS)	12.67		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0321	KM Geo Mean	1.033
KM SD (logged)	1.693	95% Critical H Value (KM-Log)	3.273
KM Standard Error of Mean (logged)	0.29	95% H-UCL (KM -Log)	11.03
KM SD (logged)	1.693	95% Critical H Value (KM-Log)	3.273
KM Standard Error of Mean (logged)	0.29		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	6.287	Mean in Log Scale	0.101
SD in Original Scale	21.63	SD in Log Scale	1.81
95% t UCL (Assumes normality)	12.38	95% H-Stat UCL	16.3

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 (Chebyshev) UCL 21.38

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

4,4'-DDT (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	31
Number of Detects	29	Number of Non-Detects	7
Number of Distinct Detects	26	Number of Distinct Non-Detects	5
Minimum Detect	0.012	Minimum Non-Detect	0.009
Maximum Detect	1600	Maximum Non-Detect	0.22
Variance Detects	124989	Percent Non-Detects	19.44%
Mean Detects	96.82	SD Detects	353.5
Median Detects	0.68	CV Detects	3.651
Skewness Detects	3.806	Kurtosis Detects	13.99
Mean of Logged Detects	0.205	SD of Logged Detects	2.781

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.304	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.518	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.161	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

KM Mean	78	KM Standard Error of Mean	53.28
KM SD	314.1	95% KM (BCA) UCL	168.1
95% KM (t) UCL	168	95% KM (Percentile Bootstrap) UCL	167.6
95% KM (z) UCL	165.6	95% KM Bootstrap t UCL	4261
90% KM Chebyshev UCL	237.8	95% KM Chebyshev UCL	310.3
97.5% KM Chebyshev UCL	410.8	99% KM Chebyshev UCL	608.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.309	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.93	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.332	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.182	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)	0.172	k star (bias corrected MLE)	0.178
Theta hat (MLE)	561.7	Theta star (bias corrected MLE)	545.4
nu hat (MLE)	9.997	nu star (bias corrected)	10.3
Mean (detects)	96.82		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	78
Maximum	1600	Median	0.445
SD	318.6	CV	4.085
k hat (MLE)	0.151	k star (bias corrected MLE)	0.157
Theta hat (MLE)	516.7	Theta star (bias corrected MLE)	497.2
nu hat (MLE)	10.87	nu star (bias corrected)	11.3
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (11.30, α)	4.767	Adjusted Chi Square Value (11.30, β)	4.575
95% Gamma Approximate UCL (use when n>=50)	184.8	95% Gamma Adjusted UCL (use when n<50)	192.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	78	SD (KM)	314.1
Variance (KM)	98682	SE of Mean (KM)	53.28
k hat (KM)	0.0617	k star (KM)	0.075
nu hat (KM)	4.439	nu star (KM)	5.403
theta hat (KM)	1265	theta star (KM)	1040
80% gamma percentile (KM)	32.59	90% gamma percentile (KM)	177.2
95% gamma percentile (KM)	451.8	99% gamma percentile (KM)	1424

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.40, α)	1.343	Adjusted Chi Square Value (5.40, β)	1.254
95% Gamma Approximate KM-UCL (use when n>=50)	313.9	95% Gamma Adjusted KM-UCL (use when n<50)	336

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.15	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.161	Detected Data appear 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	78	Mean in Log Scale	-0.884
SD in Original Scale	318.6	SD in Log Scale	3.388
95% t UCL (assumes normality of ROS data)	167.7	95% Percentile Bootstrap UCL	169.5
95% BCA Bootstrap UCL	225.4	95% Bootstrap t UCL	4146
95% H-UCL (Log ROS)	3648		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.676	KM Geo Mean	0.509
KM SD (logged)	3.054	95% Critical H Value (KM-Log)	5.319
KM Standard Error of Mean (logged)	0.52	95% H-UCL (KM -Log)	841.7
KM SD (logged)	3.054	95% Critical H Value (KM-Log)	5.319
KM Standard Error of Mean (logged)	0.52		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	78	Mean in Log Scale	-0.554
SD in Original Scale	318.6	SD in Log Scale	2.966
95% t UCL (Assumes normality)	167.7	95% H-Stat UCL	627.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	410.8

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 (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	33
Number of Detects	21	Number of Non-Detects	15
Number of Distinct Detects	20	Number of Distinct Non-Detects	13
Minimum Detect	0.012	Minimum Non-Detect	0.0041
Maximum Detect	340	Maximum Non-Detect	0.48
Variance Detects	5639	Percent Non-Detects	41.67%
Mean Detects	21.75	SD Detects	75.09
Median Detects	0.16	CV Detects	3.452
Skewness Detects	4.213	Kurtosis Detects	18.31
Mean of Logged Detects	-0.968	SD of Logged Detects	2.846

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.325	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.908	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.43	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.188	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

KM Mean	12.7	KM Standard Error of Mean	9.733
KM SD	56.99	95% KM (BCA) UCL	31.06
95% KM (t) UCL	29.14	95% KM (Percentile Bootstrap) UCL	30.25
95% KM (z) UCL	28.71	95% KM Bootstrap t UCL	242.5
90% KM Chebyshev UCL	41.89	95% KM Chebyshev UCL	55.12
97.5% KM Chebyshev UCL	73.48	99% KM Chebyshev UCL	109.5

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.709	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.911	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.304	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.211	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)	0.184	k star (bias corrected MLE)	0.19
Theta hat (MLE)	118.1	Theta star (bias corrected MLE)	114.7
nu hat (MLE)	7.734	nu star (bias corrected)	7.962
Mean (detects)	21.75		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	12.69
Maximum	340	Median	0.033
SD	57.8	CV	4.553
k hat (MLE)	0.153	k star (bias corrected MLE)	0.158
Theta hat (MLE)	83.19	Theta star (bias corrected MLE)	80.14
nu hat (MLE)	10.99	nu star (bias corrected)	11.4
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (11.40, α)	4.837	Adjusted Chi Square Value (11.40, β)	4.643
95% Gamma Approximate UCL (use when n>=50)	29.93	95% Gamma Adjusted UCL (use when n<50)	31.18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	12.7	SD (KM)	56.99
Variance (KM)	3248	SE of Mean (KM)	9.733
k hat (KM)	0.0496	k star (KM)	0.064
nu hat (KM)	3.574	nu star (KM)	4.609
theta hat (KM)	255.8	theta star (KM)	198.3
80% gamma percentile (KM)	3.653	90% gamma percentile (KM)	25.41
95% gamma percentile (KM)	72.08	99% gamma percentile (KM)	249

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.61, α)	0.976	Adjusted Chi Square Value (4.61, β)	0.905
95% Gamma Approximate KM-UCL (use when n>=50)	59.95	95% Gamma Adjusted KM-UCL (use when n<50)	64.7

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.188	Detected Data appear 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	12.69	Mean in Log Scale	-3.365
SD in Original Scale	57.8	SD in Log Scale	3.695
95% t UCL (assumes normality of ROS data)	28.97	95% Percentile Bootstrap UCL	31.36
95% BCA Bootstrap UCL	41.48	95% Bootstrap t UCL	260.4
95% H-UCL (Log ROS)	1656		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.644	KM Geo Mean	0.071
KM SD (logged)	2.978	95% Critical H Value (KM-Log)	5.199
KM Standard Error of Mean (logged)	0.519	95% H-UCL (KM -Log)	81.98
KM SD (logged)	2.978	95% Critical H Value (KM-Log)	5.199
KM Standard Error of Mean (logged)	0.519		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	12.71	Mean in Log Scale	-2.363
SD in Original Scale	57.79	SD in Log Scale	2.932
95% t UCL (Assumes normality)	28.99	95% H-Stat UCL	88.09

DL/2 is not a recommended method, provided for comparisons and historical reasons

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 73.48

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-BHC (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	21
Number of Detects	7	Number of Non-Detects	29
Number of Distinct Detects	7	Number of Distinct Non-Detects	15
Minimum Detect	0.022	Minimum Non-Detect	0.012
Maximum Detect	1.1	Maximum Non-Detect	0.25
Variance Detects	0.156	Percent Non-Detects	80.56%
Mean Detects	0.205	SD Detects	0.395
Median Detects	0.076	CV Detects	1.925
Skewness Detects	2.62	Kurtosis Detects	6.896
Mean of Logged Detects	-2.57	SD of Logged Detects	1.297

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.517	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.471	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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

KM Mean	0.0567	KM Standard Error of Mean	0.0323
KM SD	0.178	95% KM (BCA) UCL	0.145
95% KM (t) UCL	0.111	95% KM (Percentile Bootstrap) UCL	0.119
95% KM (z) UCL	0.11	95% KM Bootstrap t UCL	0.278
90% KM Chebyshev UCL	0.154	95% KM Chebyshev UCL	0.197
97.5% KM Chebyshev UCL	0.258	99% KM Chebyshev UCL	0.378

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.071	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.744	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.405	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.325	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)	0.622	k star (bias corrected MLE)	0.451
Theta hat (MLE)	0.33	Theta star (bias corrected MLE)	0.456
nu hat (MLE)	8.713	nu star (bias corrected)	6.312
Mean (detects)	0.205		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0517
Maximum	1.1	Median	0.01
SD	0.182	CV	3.521
k hat (MLE)	0.536	k star (bias corrected MLE)	0.509
Theta hat (MLE)	0.0966	Theta star (bias corrected MLE)	0.102
nu hat (MLE)	38.56	nu star (bias corrected)	36.68
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (36.68, α)	23.82	Adjusted Chi Square Value (36.68, β)	23.35
95% Gamma Approximate UCL (use when n>=50)	0.0797	95% Gamma Adjusted UCL (use when n<50)	0.0813

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0567	SD (KM)	0.178
Variance (KM)	0.0317	SE of Mean (KM)	0.0323
k hat (KM)	0.101	k star (KM)	0.112
nu hat (KM)	7.305	nu star (KM)	8.03
theta hat (KM)	0.559	theta star (KM)	0.508
80% gamma percentile (KM)	0.0456	90% gamma percentile (KM)	0.157
95% gamma percentile (KM)	0.326	99% gamma percentile (KM)	0.852

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.03, α)	2.752	Adjusted Chi Square Value (8.03, β)	2.614
95% Gamma Approximate KM-UCL (use when n>=50)	0.165	95% Gamma Adjusted KM-UCL (use when n<50)	0.174

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.304	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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	0.0481	Mean in Log Scale	-4.647
SD in Original Scale	0.182	SD in Log Scale	1.469
95% t UCL (assumes normality of ROS data)	0.0993	95% Percentile Bootstrap UCL	0.105
95% BCA Bootstrap UCL	0.146	95% Bootstrap t UCL	0.368
95% H-UCL (Log ROS)	0.0589		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.8	KM Geo Mean	0.0224
KM SD (logged)	0.956	95% Critical H Value (KM-Log)	2.333
KM Standard Error of Mean (logged)	0.217	95% H-UCL (KM -Log)	0.0515
KM SD (logged)	0.956	95% Critical H Value (KM-Log)	2.333
KM Standard Error of Mean (logged)	0.217		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.072	Mean in Log Scale	-3.321
SD in Original Scale	0.179	SD in Log Scale	0.968
95% t UCL (Assumes normality)	0.122	95% H-Stat UCL	0.0847

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

KM H-UCL 0.0515

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-BHC (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	27
Number of Detects	4	Number of Non-Detects	32
Number of Distinct Detects	4	Number of Distinct Non-Detects	23
Minimum Detect	0.025	Minimum Non-Detect	0.002
Maximum Detect	0.61	Maximum Non-Detect	3.8
Variance Detects	0.064	Percent Non-Detects	88.89%
Mean Detects	0.246	SD Detects	0.253
Median Detects	0.175	CV Detects	1.027
Skewness Detects	1.504	Kurtosis Detects	2.773
Mean of Logged Detects	-1.919	SD of Logged Detects	1.321

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.338	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.0349	KM Standard Error of Mean	0.0223
KM SD	0.11	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0726	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0716	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.102	95% KM Chebyshev UCL	0.132
97.5% KM Chebyshev UCL	0.174	99% KM Chebyshev UCL	0.257

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.274	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.666	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.224	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.402	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)	1.103	k star (bias corrected MLE)	0.442
Theta hat (MLE)	0.223	Theta star (bias corrected MLE)	0.557
nu hat (MLE)	8.821	nu star (bias corrected)	3.539
Mean (detects)	0.246		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0363
Maximum	0.61	Median	0.01
SD	0.106	CV	2.913
k hat (MLE)	0.621	k star (bias corrected MLE)	0.588
Theta hat (MLE)	0.0583	Theta star (bias corrected MLE)	0.0616
nu hat (MLE)	44.73	nu star (bias corrected)	42.34
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (42.34, α)	28.42	Adjusted Chi Square Value (42.34, β)	27.9
95% Gamma Approximate UCL (use when n>=50)	0.054	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0349	SD (KM)	0.11
Variance (KM)	0.0121	SE of Mean (KM)	0.0223
k hat (KM)	0.1	k star (KM)	0.111
nu hat (KM)	7.236	nu star (KM)	7.966
theta hat (KM)	0.347	theta star (KM)	0.315
80% gamma percentile (KM)	0.0277	90% gamma percentile (KM)	0.0964
95% gamma percentile (KM)	0.201	99% gamma percentile (KM)	0.526

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.97, α)	2.715	Adjusted Chi Square Value (7.97, β)	2.578
95% Gamma Approximate KM-UCL (use when n>=50)	0.102	95% Gamma Adjusted KM-UCL (use when n<50)	0.108

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.276	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.0295	Mean in Log Scale	-5.941
SD in Original Scale	0.107	SD in Log Scale	1.72
95% t UCL (assumes normality of ROS data)	0.0597	95% Percentile Bootstrap UCL	0.0606
95% BCA Bootstrap UCL	0.0913	95% Bootstrap t UCL	0.123
95% H-UCL (Log ROS)	0.0303		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.486	KM Geo Mean	0.00414
KM SD (logged)	1.579	95% Critical H Value (KM-Log)	3.116
KM Standard Error of Mean (logged)	0.39	95% H-UCL (KM -Log)	0.0331
KM SD (logged)	1.579	95% Critical H Value (KM-Log)	3.116
KM Standard Error of Mean (logged)	0.39		

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.148	Mean in Log Scale	-3.225
SD in Original Scale	0.361	SD in Log Scale	1.585
95% t UCL (Assumes normality)	0.25	95% H-Stat UCL	0.323

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 0.0726

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-BHC (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	3	Number of Non-Detects	33
Number of Distinct Detects	3	Number of Distinct Non-Detects	21
Minimum Detect	0.061	Minimum Non-Detect	0.0022
Maximum Detect	0.14	Maximum Non-Detect	4.9
Variance Detects	0.00169	Percent Non-Detects	91.67%
Mean Detects	0.107	SD Detects	0.0411
Median Detects	0.12	CV Detects	0.384
Skewness Detects	-1.282	Kurtosis Detects	N/A
Mean of Logged Detects	-2.294	SD of Logged Detects	0.442

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	0.925	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.291	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0138	KM Standard Error of Mean	0.00804
KM SD	0.0344	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0274	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.027	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0379	95% KM Chebyshev UCL	0.0488
97.5% KM Chebyshev UCL	0.064	99% KM Chebyshev UCL	0.0938

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	8.568	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0125	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	51.41	nu star (bias corrected)	N/A
Mean (detects)	0.107		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0186
Maximum	0.14	Median	0.01
SD	0.0288	CV	1.555
k hat (MLE)	1.422	k star (bias corrected MLE)	1.322
Theta hat (MLE)	0.013	Theta star (bias corrected MLE)	0.014
nu hat (MLE)	102.4	nu star (bias corrected)	95.18
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (95.18, α)	73.68	Adjusted Chi Square Value (95.18, β)	72.82
95% Gamma Approximate UCL (use when n>=50)	0.024	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0138	SD (KM)	0.0344
Variance (KM)	0.00118	SE of Mean (KM)	0.00804
k hat (KM)	0.161	k star (KM)	0.166
nu hat (KM)	11.62	nu star (KM)	11.99
theta hat (KM)	0.0856	theta star (KM)	0.0829
80% gamma percentile (KM)	0.0163	90% gamma percentile (KM)	0.0414
95% gamma percentile (KM)	0.0744	99% gamma percentile (KM)	0.168

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.99, α)	5.217	Adjusted Chi Square Value (11.99, β)	5.015
95% Gamma Approximate KM-UCL (use when n>=50)	0.0317	95% Gamma Adjusted KM-UCL (use when n<50)	0.033

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.0262	Mean in Log Scale	-3.893
SD in Original Scale	0.0275	SD in Log Scale	0.617
95% t UCL (assumes normality of ROS data)	0.034	95% Percentile Bootstrap UCL	0.0342
95% BCA Bootstrap UCL	0.0377	95% Bootstrap t UCL	0.0464
95% H-UCL (Log ROS)	0.0304		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.687	KM Geo Mean	0.00339
KM SD (logged)	1.212	95% Critical H Value (KM-Log)	2.634
KM Standard Error of Mean (logged)	0.288	95% H-UCL (KM -Log)	0.0121
KM SD (logged)	1.212	95% Critical H Value (KM-Log)	2.634
KM Standard Error of Mean (logged)	0.288		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.139	Mean in Log Scale	-3.744
SD in Original Scale	0.439	SD in Log Scale	1.763
95% t UCL (Assumes normality)	0.263	95% H-Stat UCL	0.306

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 0.0274

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

alpha-BHC (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	23

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (4) was not processed!

alpha-Chlordane (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	21
Number of Detects	6	Number of Non-Detects	30
Number of Distinct Detects	6	Number of Distinct Non-Detects	18
Minimum Detect	0.045	Minimum Non-Detect	0.012
Maximum Detect	0.22	Maximum Non-Detect	0.25
Variance Detects	0.0056	Percent Non-Detects	83.33%
Mean Detects	0.125	SD Detects	0.0748
Median Detects	0.12	CV Detects	0.597
Skewness Detects	0.181	Kurtosis Detects	-1.978
Mean of Logged Detects	-2.258	SD of Logged Detects	0.694

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.186	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	0.0346	KM Standard Error of Mean	0.0101
KM SD	0.052	95% KM (BCA) UCL	0.0598
95% KM (t) UCL	0.0516	95% KM (Percentile Bootstrap) UCL	0.0541
95% KM (z) UCL	0.0512	95% KM Bootstrap t UCL	0.0481
90% KM Chebyshev UCL	0.0649	95% KM Chebyshev UCL	0.0786
97.5% KM Chebyshev UCL	0.0977	99% KM Chebyshev UCL	0.135

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.372	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.702	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.224	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.335	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)	2.908	k star (bias corrected MLE)	1.565
Theta hat (MLE)	0.0431	Theta star (bias corrected MLE)	0.0801
nu hat (MLE)	34.89	nu star (bias corrected)	18.78
Mean (detects)	0.125		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0301
Maximum	0.22	Median	0.01
SD	0.0519	CV	1.722
k hat (MLE)	0.874	k star (bias corrected MLE)	0.82
Theta hat (MLE)	0.0345	Theta star (bias corrected MLE)	0.0368
nu hat (MLE)	62.94	nu star (bias corrected)	59.03
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (59.03, α)	42.37	Adjusted Chi Square Value (59.03, β)	41.72
95% Gamma Approximate UCL (use when n>=50)	0.042	95% Gamma Adjusted UCL (use when n<50)	0.0426

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0346	SD (KM)	0.052
Variance (KM)	0.0027	SE of Mean (KM)	0.0101
k hat (KM)	0.442	k star (KM)	0.423
nu hat (KM)	31.8	nu star (KM)	30.48
theta hat (KM)	0.0783	theta star (KM)	0.0816
80% gamma percentile (KM)	0.0561	90% gamma percentile (KM)	0.0966
95% gamma percentile (KM)	0.141	99% gamma percentile (KM)	0.251

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (30.48, α)	18.87	Adjusted Chi Square Value (30.48, β)	18.46
95% Gamma Approximate KM-UCL (use when n>=50)	0.0558	95% Gamma Adjusted KM-UCL (use when n<50)	0.0571

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.88	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	0.0329	Mean in Log Scale	-4.022
SD in Original Scale	0.0512	SD in Log Scale	0.969
95% t UCL (assumes normality of ROS data)	0.0474	95% Percentile Bootstrap UCL	0.0473
95% BCA Bootstrap UCL	0.0516	95% Bootstrap t UCL	0.0595
95% H-UCL (Log ROS)	0.0421		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.954	KM Geo Mean	0.0192
KM SD (logged)	0.902	95% Critical H Value (KM-Log)	2.275
KM Standard Error of Mean (logged)	0.189	95% H-UCL (KM -Log)	0.0407
KM SD (logged)	0.902	95% Critical H Value (KM-Log)	2.275
KM Standard Error of Mean (logged)	0.189		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0523	Mean in Log Scale	-3.363
SD in Original Scale	0.0511	SD in Log Scale	0.937
95% t UCL (Assumes normality)	0.0666	95% H-Stat UCL	0.0774

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 0.0516

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 (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	26
Number of Detects	11	Number of Non-Detects	25
Number of Distinct Detects	11	Number of Distinct Non-Detects	17
Minimum Detect	0.012	Minimum Non-Detect	0.01
Maximum Detect	11	Maximum Non-Detect	0.24
Variance Detects	10.88	Percent Non-Detects	69.44%
Mean Detects	1.909	SD Detects	3.298
Median Detects	0.46	CV Detects	1.728
Skewness Detects	2.473	Kurtosis Detects	6.54
Mean of Logged Detects	-0.997	SD of Logged Detects	2.218

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.641	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	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

KM Mean	0.594	KM Standard Error of Mean	0.34
KM SD	1.945	95% KM (BCA) UCL	1.261
95% KM (t) UCL	1.168	95% KM (Percentile Bootstrap) UCL	1.182
95% KM (z) UCL	1.153	95% KM Bootstrap t UCL	2.068
90% KM Chebyshev UCL	1.614	95% KM Chebyshev UCL	2.076
97.5% KM Chebyshev UCL	2.717	99% KM Chebyshev UCL	3.977

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.337	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.801	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.171	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.272	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)	0.4	k star (bias corrected MLE)	0.352
Theta hat (MLE)	4.769	Theta star (bias corrected MLE)	5.428
nu hat (MLE)	8.806	nu star (bias corrected)	7.738
Mean (detects)	1.909		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.59
Maximum	11	Median	0.01
SD	1.974	CV	3.344
k hat (MLE)	0.24	k star (bias corrected MLE)	0.239
Theta hat (MLE)	2.457	Theta star (bias corrected MLE)	2.472
nu hat (MLE)	17.3	nu star (bias corrected)	17.19
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (17.19, α)	8.808	Adjusted Chi Square Value (17.19, β)	8.535
95% Gamma Approximate UCL (use when n>=50)	1.152	95% Gamma Adjusted UCL (use when n<50)	1.189

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.594	SD (KM)	1.945
Variance (KM)	3.783	SE of Mean (KM)	0.34
k hat (KM)	0.0932	k star (KM)	0.104
nu hat (KM)	6.708	nu star (KM)	7.482
theta hat (KM)	6.373	theta star (KM)	5.713
80% gamma percentile (KM)	0.435	90% gamma percentile (KM)	1.604
95% gamma percentile (KM)	3.437	99% gamma percentile (KM)	9.25

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.48, α)	2.439	Adjusted Chi Square Value (7.48, β)	2.31
95% Gamma Approximate KM-UCL (use when n>=50)	1.821	95% Gamma Adjusted KM-UCL (use when n<50)	1.923

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.162	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	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	0.585	Mean in Log Scale	-4.857
SD in Original Scale	1.975	SD in Log Scale	3.052
95% t UCL (assumes normality of ROS data)	1.142	95% Percentile Bootstrap UCL	1.182
95% BCA Bootstrap UCL	1.55	95% Bootstrap t UCL	2.247
95% H-UCL (Log ROS)	12.72		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.336	KM Geo Mean	0.0356
KM SD (logged)	1.984	95% Critical H Value (KM-Log)	3.691
KM Standard Error of Mean (logged)	0.361	95% H-UCL (KM -Log)	0.877
KM SD (logged)	1.984	95% Critical H Value (KM-Log)	3.691
KM Standard Error of Mean (logged)	0.361		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.617	Mean in Log Scale	-2.726
SD in Original Scale	1.966	SD in Log Scale	1.87
95% t UCL (Assumes normality)	1.17	95% H-Stat UCL	1.148

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	1.923

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 (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	26
Number of Detects	8	Number of Non-Detects	28
Number of Distinct Detects	8	Number of Distinct Non-Detects	18
Minimum Detect	0.0055	Minimum Non-Detect	0.0024
Maximum Detect	23	Maximum Non-Detect	2.3
Variance Detects	64.16	Percent Non-Detects	77.78%
Mean Detects	3.203	SD Detects	8.01
Median Detects	0.31	CV Detects	2.501
Skewness Detects	2.813	Kurtosis Detects	7.935
Mean of Logged Detects	-1.421	SD of Logged Detects	2.669

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.461	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.469	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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

KM Mean	0.718	KM Standard Error of Mean	0.672
KM SD	3.774	95% KM (BCA) UCL	1.993
95% KM (t) UCL	1.854	95% KM (Percentile Bootstrap) UCL	1.979
95% KM (z) UCL	1.824	95% KM Bootstrap t UCL	22.05
90% KM Chebyshev UCL	2.736	95% KM Chebyshev UCL	3.649
97.5% KM Chebyshev UCL	4.918	99% KM Chebyshev UCL	7.409

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.712	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.808	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.282	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.319	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)	0.271	k star (bias corrected MLE)	0.253
Theta hat (MLE)	11.81	Theta star (bias corrected MLE)	12.67
nu hat (MLE)	4.339	nu star (bias corrected)	4.045
Mean (detects)	3.203		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0055	Mean	0.72
Maximum	23	Median	0.01
SD	3.827	CV	5.318
k hat (MLE)	0.205	k star (bias corrected MLE)	0.207
Theta hat (MLE)	3.504	Theta star (bias corrected MLE)	3.48
nu hat (MLE)	14.79	nu star (bias corrected)	14.89
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (14.89, α)	7.184	Adjusted Chi Square Value (14.89, β)	6.941
95% Gamma Approximate UCL (use when n>=50)	1.491	95% Gamma Adjusted UCL (use when n<50)	1.544

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.718	SD (KM)	3.774
Variance (KM)	14.24	SE of Mean (KM)	0.672
k hat (KM)	0.0362	k star (KM)	0.0517
nu hat (KM)	2.608	nu star (KM)	3.724
theta hat (KM)	19.83	theta star (KM)	13.89
80% gamma percentile (KM)	0.11	90% gamma percentile (KM)	1.145
95% gamma percentile (KM)	3.865	99% gamma percentile (KM)	15.41

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.72, α)	0.616	Adjusted Chi Square Value (3.72, β)	0.564
95% Gamma Approximate KM-UCL (use when n>=50)	4.344	95% Gamma Adjusted KM-UCL (use when n<50)	4.742

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	0.713	Mean in Log Scale	-6.651
SD in Original Scale	3.828	SD in Log Scale	3.413
95% t UCL (assumes normality of ROS data)	1.791	95% Percentile Bootstrap UCL	1.974
95% BCA Bootstrap UCL	2.694	95% Bootstrap t UCL	25.02
95% H-UCL (Log ROS)	13		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.723	KM Geo Mean	0.00889
KM SD (logged)	2.214	95% Critical H Value (KM-Log)	4.031
KM Standard Error of Mean (logged)	0.436	95% H-UCL (KM -Log)	0.467
KM SD (logged)	2.214	95% Critical H Value (KM-Log)	4.031
KM Standard Error of Mean (logged)	0.436		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.769	Mean in Log Scale	-3.402
SD in Original Scale	3.822	SD in Log Scale	2.077
95% t UCL (Assumes normality)	1.845	95% H-Stat UCL	1.103

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	4.742

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

alpha-Chlordane (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	2	Number of Non-Detects	34
Number of Distinct Detects	2	Number of Distinct Non-Detects	22
Minimum Detect	0.078	Minimum Non-Detect	0.0021
Maximum Detect	0.6	Maximum Non-Detect	2.1
Variance Detects	0.136	Percent Non-Detects	94.44%
Mean Detects	0.339	SD Detects	0.369
Median Detects	0.339	CV Detects	1.089
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.531	SD of Logged Detects	1.443

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

KM Mean	0.0218	KM Standard Error of Mean	0.024
KM SD	0.1	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0623	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0613	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0938	95% KM Chebyshev UCL	0.126
97.5% KM Chebyshev UCL	0.172	99% KM Chebyshev UCL	0.26

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.254	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.27	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.014	nu star (bias corrected)	N/A
Mean (detects)	0.339		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0218	SD (KM)	0.1
Variance (KM)	0.01	SE of Mean (KM)	0.024
k hat (KM)	0.0475	k star (KM)	0.062
nu hat (KM)	3.418	nu star (KM)	4.467
theta hat (KM)	0.46	theta star (KM)	0.352
80% gamma percentile (KM)	0.00577	90% gamma percentile (KM)	0.0424
95% gamma percentile (KM)	0.123	99% gamma percentile (KM)	0.434

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0428
Approximate Chi Square Value (4.47, α)	0.914	Adjusted Chi Square Value (4.47, β)	0.846
95% Gamma Approximate KM-UCL (use when n>=50)	0.107	95% Gamma Adjusted KM-UCL (use when n<50)	0.115

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

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	0.019	Mean in Log Scale	-9.233
SD in Original Scale	0.1	SD in Log Scale	2.42
95% t UCL (assumes normality of ROS data)	0.0473	95% Percentile Bootstrap UCL	0.0523
95% BCA Bootstrap UCL	0.0712	95% Bootstrap t UCL	5.82
95% H-UCL (Log ROS)	0.0108		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.879	KM Geo Mean	0.0028
KM SD (logged)	1.133	95% Critical H Value (KM-Log)	2.538
KM Standard Error of Mean (logged)	0.281	95% H-UCL (KM -Log)	0.00865
KM SD (logged)	1.133	95% Critical H Value (KM-Log)	2.538
KM Standard Error of Mean (logged)	0.281		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0724	Mean in Log Scale	-4.382
SD in Original Scale	0.197	SD in Log Scale	1.779
95% t UCL (Assumes normality)	0.128	95% H-Stat UCL	0.169

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 (Chebyshev) UCL 0.126

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.

Arsenic (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	36
Number of Detects	34	Number of Non-Detects	2
Number of Distinct Detects	34	Number of Distinct Non-Detects	2
Minimum Detect	12.7	Minimum Non-Detect	8
Maximum Detect	2430	Maximum Non-Detect	10.2
Variance Detects	183422	Percent Non-Detects	5.556%
Mean Detects	281.5	SD Detects	428.3
Median Detects	165.5	CV Detects	1.521
Skewness Detects	4.115	Kurtosis Detects	19.94
Mean of Logged Detects	4.972	SD of Logged Detects	1.221

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.554	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.265	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	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

KM Mean	266.3	KM Standard Error of Mean	70.17
KM SD	414.8	95% KM (BCA) UCL	386.2
95% KM (t) UCL	384.9	95% KM (Percentile Bootstrap) UCL	401.6
95% KM (z) UCL	381.7	95% KM Bootstrap t UCL	516
90% KM Chebyshev UCL	476.8	95% KM Chebyshev UCL	572.2
97.5% KM Chebyshev UCL	704.5	99% KM Chebyshev UCL	964.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.489	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.782	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.111	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.156	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)	0.878	k star (bias corrected MLE)	0.82
Theta hat (MLE)	320.8	Theta star (bias corrected MLE)	343.4
nu hat (MLE)	59.68	nu star (bias corrected)	55.74
Mean (detects)	281.5		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	265.9
Maximum	2430	Median	156
SD	421	CV	1.583
k hat (MLE)	0.548	k star (bias corrected MLE)	0.521
Theta hat (MLE)	485.3	Theta star (bias corrected MLE)	510.5
nu hat (MLE)	39.45	nu star (bias corrected)	37.49
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (37.49, α)	24.47	Adjusted Chi Square Value (37.49, β)	24
95% Gamma Approximate UCL (use when n>=50)	407.3	95% Gamma Adjusted UCL (use when n<50)	415.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	266.3	SD (KM)	414.8
Variance (KM)	172061	SE of Mean (KM)	70.17
k hat (KM)	0.412	k star (KM)	0.396
nu hat (KM)	29.68	nu star (KM)	28.54
theta hat (KM)	646.1	theta star (KM)	671.9
80% gamma percentile (KM)	429.3	90% gamma percentile (KM)	753.4
95% gamma percentile (KM)	1110	99% gamma percentile (KM)	2008

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.54, α)	17.35	Adjusted Chi Square Value (28.54, β)	16.95
95% Gamma Approximate KM-UCL (use when n>=50)	438.1	95% Gamma Adjusted KM-UCL (use when n<50)	448.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.123	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	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	266.3	Mean in Log Scale	4.812
SD in Original Scale	420.7	SD in Log Scale	1.361
95% t UCL (assumes normality of ROS data)	384.8	95% Percentile Bootstrap UCL	401
95% BCA Bootstrap UCL	453.1	95% Bootstrap t UCL	516.8
95% H-UCL (Log ROS)	594.1		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.811	KM Geo Mean	122.9
KM SD (logged)	1.344	95% Critical H Value (KM-Log)	2.801
KM Standard Error of Mean (logged)	0.227	95% H-UCL (KM -Log)	572.6
KM SD (logged)	1.344	95% Critical H Value (KM-Log)	2.801
KM Standard Error of Mean (logged)	0.227		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	266.1	Mean in Log Scale	4.779
SD in Original Scale	420.8	SD in Log Scale	1.433
95% t UCL (Assumes normality)	384.6	95% H-Stat UCL	674.2

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	448.4

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Arsenic (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	34
Number of Detects	26	Number of Non-Detects	10
Number of Distinct Detects	26	Number of Distinct Non-Detects	8
Minimum Detect	7.67	Minimum Non-Detect	7.33
Maximum Detect	331	Maximum Non-Detect	7.48
Variance Detects	9115	Percent Non-Detects	27.78%
Mean Detects	72.98	SD Detects	95.47
Median Detects	36.3	CV Detects	1.308
Skewness Detects	2.074	Kurtosis Detects	3.277
Mean of Logged Detects	3.652	SD of Logged Detects	1.13

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.654	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.297	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.17	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

KM Mean	54.75	KM Standard Error of Mean	14.42
KM SD	84.82	95% KM (BCA) UCL	78.75
95% KM (t) UCL	79.1	95% KM (Percentile Bootstrap) UCL	80.89
95% KM (z) UCL	78.46	95% KM Bootstrap t UCL	92.59
90% KM Chebyshev UCL	98	95% KM Chebyshev UCL	117.6
97.5% KM Chebyshev UCL	144.8	99% KM Chebyshev UCL	198.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.015	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.777	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.164	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.177	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.914	k star (bias corrected MLE)	0.834
Theta hat (MLE)	79.83	Theta star (bias corrected MLE)	87.47
nu hat (MLE)	47.54	nu star (bias corrected)	43.39
Mean (detects)	72.98		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	52.71
Maximum	331	Median	22.6
SD	87.23	CV	1.655
k hat (MLE)	0.269	k star (bias corrected MLE)	0.265
Theta hat (MLE)	195.8	Theta star (bias corrected MLE)	198.7
nu hat (MLE)	19.39	nu star (bias corrected)	19.1
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (19.10, α)	10.19	Adjusted Chi Square Value (19.10, β)	9.897
95% Gamma Approximate UCL (use when n>=50)	98.79	95% Gamma Adjusted UCL (use when n<50)	101.7

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	54.75	SD (KM)	84.82
Variance (KM)	7195	SE of Mean (KM)	14.42
k hat (KM)	0.417	k star (KM)	0.4
nu hat (KM)	29.99	nu star (KM)	28.83
theta hat (KM)	131.4	theta star (KM)	136.7
80% gamma percentile (KM)	88.36	90% gamma percentile (KM)	154.6
95% gamma percentile (KM)	227.4	99% gamma percentile (KM)	410.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.83, α)	17.57	Adjusted Chi Square Value (28.83, β)	17.17
95% Gamma Approximate KM-UCL (use when n>=50)	89.8	95% Gamma Adjusted KM-UCL (use when n<50)	91.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.92	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0869	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.17	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	53.52	Mean in Log Scale	2.929
SD in Original Scale	86.74	SD in Log Scale	1.524
95% t UCL (assumes normality of ROS data)	77.95	95% Percentile Bootstrap UCL	79.19
95% BCA Bootstrap UCL	83.8	95% Bootstrap t UCL	90.87
95% H-UCL (Log ROS)	130.9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.191	KM Geo Mean	24.31
KM SD (logged)	1.2	95% Critical H Value (KM-Log)	2.619
KM Standard Error of Mean (logged)	0.204	95% H-UCL (KM -Log)	84.92
KM SD (logged)	1.2	95% Critical H Value (KM-Log)	2.619
KM Standard Error of Mean (logged)	0.204		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	53.74	Mean in Log Scale	3.002
SD in Original Scale	86.61	SD in Log Scale	1.429
95% t UCL (Assumes normality)	78.13	95% H-Stat UCL	112.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	91.9

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
Number of Detects	28	Number of Non-Detects	8
Number of Distinct Detects	28	Number of Distinct Non-Detects	7
Minimum Detect	8.38	Minimum Non-Detect	7.4
Maximum Detect	386	Maximum Non-Detect	11.1
Variance Detects	9877	Percent Non-Detects	22.22%
Mean Detects	91.89	SD Detects	99.39
Median Detects	61.7	CV Detects	1.082
Skewness Detects	1.728	Kurtosis Detects	2.577
Mean of Logged Detects	3.958	SD of Logged Detects	1.132

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.779	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.924	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.21	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.164	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

KM Mean	73.12	KM Standard Error of Mean	15.78
KM SD	92.95	95% KM (BCA) UCL	101.3
95% KM (t) UCL	99.78	95% KM (Percentile Bootstrap) UCL	99.95
95% KM (z) UCL	99.07	95% KM Bootstrap t UCL	109.3
90% KM Chebyshev UCL	120.5	95% KM Chebyshev UCL	141.9
97.5% KM Chebyshev UCL	171.6	99% KM Chebyshev UCL	230.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.565	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.773	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.141	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.17	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)	1.024	k star (bias corrected MLE)	0.938
Theta hat (MLE)	89.76	Theta star (bias corrected MLE)	97.97
nu hat (MLE)	57.33	nu star (bias corrected)	52.52
Mean (detects)	91.89		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	71.47
Maximum	386	Median	30
SD	95.5	CV	1.336
k hat (MLE)	0.31	k star (bias corrected MLE)	0.303
Theta hat (MLE)	230.7	Theta star (bias corrected MLE)	236.2
nu hat (MLE)	22.31	nu star (bias corrected)	21.78
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (21.78, α)	12.17	Adjusted Chi Square Value (21.78, β)	11.85
95% Gamma Approximate UCL (use when n>=50)	127.9	95% Gamma Adjusted UCL (use when n<50)	131.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	73.12	SD (KM)	92.95
Variance (KM)	8640	SE of Mean (KM)	15.78
k hat (KM)	0.619	k star (KM)	0.586
nu hat (KM)	44.56	nu star (KM)	42.18
theta hat (KM)	118.2	theta star (KM)	124.8
80% gamma percentile (KM)	120.5	90% gamma percentile (KM)	191.2
95% gamma percentile (KM)	265.4	99% gamma percentile (KM)	445.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (42.18, α)	28.29	Adjusted Chi Square Value (42.18, β)	27.77
95% Gamma Approximate KM-UCL (use when n>=50)	109	95% Gamma Adjusted KM-UCL (use when n<50)	111.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.924	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.164	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	72.42	Mean in Log Scale	3.399
SD in Original Scale	94.78	SD in Log Scale	1.457
95% t UCL (assumes normality of ROS data)	99.11	95% Percentile Bootstrap UCL	99.33
95% BCA Bootstrap UCL	102.8	95% Bootstrap t UCL	108.5
95% H-UCL (Log ROS)	178.8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.525	KM Geo Mean	33.96
KM SD (logged)	1.272	95% Critical H Value (KM-Log)	2.71
KM Standard Error of Mean (logged)	0.216	95% H-UCL (KM -Log)	136.6
KM SD (logged)	1.272	95% Critical H Value (KM-Log)	2.71
KM Standard Error of Mean (logged)	0.216		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	72.41	Mean in Log Scale	3.397
SD in Original Scale	94.79	SD in Log Scale	1.46
95% t UCL (Assumes normality)	99.1	95% H-Stat UCL	179.5

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 111.1

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.

Arsenic (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	36
Number of Detects	27	Number of Non-Detects	9
Number of Distinct Detects	27	Number of Distinct Non-Detects	9
Minimum Detect	8.02	Minimum Non-Detect	7.14
Maximum Detect	1140	Maximum Non-Detect	11.6
Variance Detects	53709	Percent Non-Detects	25%
Mean Detects	117.6	SD Detects	231.8
Median Detects	27.2	CV Detects	1.971
Skewness Detects	3.659	Kurtosis Detects	15.23
Mean of Logged Detects	3.69	SD of Logged Detects	1.386

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.515	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.923	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.325	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.167	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

KM Mean	90	KM Standard Error of Mean	34.42
KM SD	202.7	95% KM (BCA) UCL	154.2
95% KM (t) UCL	148.2	95% KM (Percentile Bootstrap) UCL	153.5
95% KM (z) UCL	146.6	95% KM Bootstrap t UCL	220.2
90% KM Chebyshev UCL	193.3	95% KM Chebyshev UCL	240
97.5% KM Chebyshev UCL	305	99% KM Chebyshev UCL	432.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.912	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.8	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.253	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.177	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)	0.577	k star (bias corrected MLE)	0.538
Theta hat (MLE)	203.8	Theta star (bias corrected MLE)	218.8
nu hat (MLE)	31.16	nu star (bias corrected)	29.03
Mean (detects)	117.6		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	88.2
Maximum	1140	Median	15.3
SD	206.3	CV	2.339
k hat (MLE)	0.248	k star (bias corrected MLE)	0.246
Theta hat (MLE)	355.1	Theta star (bias corrected MLE)	358.3
nu hat (MLE)	17.88	nu star (bias corrected)	17.72
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (17.72, α)	9.191	Adjusted Chi Square Value (17.72, β)	8.912
95% Gamma Approximate UCL (use when n>=50)	170.1	95% Gamma Adjusted UCL (use when n<50)	175.4

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	90	SD (KM)	202.7
Variance (KM)	41074	SE of Mean (KM)	34.42
k hat (KM)	0.197	k star (KM)	0.199
nu hat (KM)	14.2	nu star (KM)	14.35
theta hat (KM)	456.4	theta star (KM)	451.6
80% gamma percentile (KM)	118.4	90% gamma percentile (KM)	272.2
95% gamma percentile (KM)	464.2	99% gamma percentile (KM)	993

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.35, α)	6.811	Adjusted Chi Square Value (14.35, β)	6.575
95% Gamma Approximate KM-UCL (use when n>=50)	189.6	95% Gamma Adjusted KM-UCL (use when n<50)	196.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.923	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.167	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	88.68	Mean in Log Scale	2.927
SD in Original Scale	206.1	SD in Log Scale	1.799
95% t UCL (assumes normality of ROS data)	146.7	95% Percentile Bootstrap UCL	151.5
95% BCA Bootstrap UCL	189.3	95% Bootstrap t UCL	224.4
95% H-UCL (Log ROS)	266.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.262	KM Geo Mean	26.09
KM SD (logged)	1.392	95% Critical H Value (KM-Log)	2.864
KM Standard Error of Mean (logged)	0.237	95% H-UCL (KM -Log)	135
KM SD (logged)	1.392	95% Critical H Value (KM-Log)	2.864
KM Standard Error of Mean (logged)	0.237		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	89.17	Mean in Log Scale	3.107
SD in Original Scale	205.9	SD in Log Scale	1.576
95% t UCL (Assumes normality)	147.2	95% H-Stat UCL	177

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 (Chebyshev) UCL	240

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.

beta-BHC (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	31
Number of Detects	24	Number of Non-Detects	12
Number of Distinct Detects	22	Number of Distinct Non-Detects	11
Minimum Detect	0.015	Minimum Non-Detect	0.019
Maximum Detect	99	Maximum Non-Detect	0.25
Variance Detects	405.8	Percent Non-Detects	33.33%
Mean Detects	4.437	SD Detects	20.14
Median Detects	0.2	CV Detects	4.54
Skewness Detects	4.897	Kurtosis Detects	23.98
Mean of Logged Detects	-1.359	SD of Logged Detects	1.648

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.222	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.518	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.177	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.969	KM Standard Error of Mean	2.764
KM SD	16.24	95% KM (BCA) UCL	8.455
95% KM (t) UCL	7.639	95% KM (Percentile Bootstrap) UCL	8.45
95% KM (z) UCL	7.515	95% KM Bootstrap t UCL	203.6
90% KM Chebyshev UCL	11.26	95% KM Chebyshev UCL	15.02
97.5% KM Chebyshev UCL	20.23	99% KM Chebyshev UCL	30.47

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	5.326	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.875	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.403	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.195	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)	0.249	k star (bias corrected MLE)	0.246
Theta hat (MLE)	17.79	Theta star (bias corrected MLE)	18.04
nu hat (MLE)	11.97	nu star (bias corrected)	11.81
Mean (detects)	4.437		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.962
Maximum	99	Median	0.14
SD	16.47	CV	5.56
k hat (MLE)	0.207	k star (bias corrected MLE)	0.209
Theta hat (MLE)	14.27	Theta star (bias corrected MLE)	14.19
nu hat (MLE)	14.94	nu star (bias corrected)	15.03
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (15.03, α)	7.28	Adjusted Chi Square Value (15.03, β)	7.035
95% Gamma Approximate UCL (use when n>=50)	6.113	95% Gamma Adjusted UCL (use when n<50)	6.326

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.969	SD (KM)	16.24
Variance (KM)	263.6	SE of Mean (KM)	2.764
k hat (KM)	0.0334	k star (KM)	0.0492
nu hat (KM)	2.407	nu star (KM)	3.54
theta hat (KM)	88.79	theta star (KM)	60.38
80% gamma percentile (KM)	0.379	90% gamma percentile (KM)	4.431
95% gamma percentile (KM)	15.69	99% gamma percentile (KM)	65

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.54, α)	0.549	Adjusted Chi Square Value (3.54, β)	0.501
95% Gamma Approximate KM-UCL (use when n>=50)	19.15	95% Gamma Adjusted KM-UCL (use when n<50)	20.96

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.831	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.916	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.177	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	2.965	Mean in Log Scale	-2.255
SD in Original Scale	16.47	SD in Log Scale	1.88
95% t UCL (assumes normality of ROS data)	7.602	95% Percentile Bootstrap UCL	8.451
95% BCA Bootstrap UCL	13.92	95% Bootstrap t UCL	200.8
95% H-UCL (Log ROS)	1.889		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.184	KM Geo Mean	0.113
KM SD (logged)	1.806	95% Critical H Value (KM-Log)	3.435
KM Standard Error of Mean (logged)	0.315	95% H-UCL (KM -Log)	1.641
KM SD (logged)	1.806	95% Critical H Value (KM-Log)	3.435
KM Standard Error of Mean (logged)	0.315		

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.972	Mean in Log Scale	-2.082
SD in Original Scale	16.46	SD in Log Scale	1.768
95% t UCL (Assumes normality)	7.609	95% H-Stat UCL	1.633

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 (Chebyshev) UCL	15.02

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.

beta-BHC (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	27
Number of Detects	12	Number of Non-Detects	24
Number of Distinct Detects	12	Number of Distinct Non-Detects	18
Minimum Detect	0.0037	Minimum Non-Detect	0.0036
Maximum Detect	31	Maximum Non-Detect	2.2
Variance Detects	77.66	Percent Non-Detects	66.67%
Mean Detects	3.313	SD Detects	8.812
Median Detects	0.22	CV Detects	2.66
Skewness Detects	3.341	Kurtosis Detects	11.34
Mean of Logged Detects	-1.283	SD of Logged Detects	2.512

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.426	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.406	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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

KM Mean	1.116	KM Standard Error of Mean	0.89
KM SD	5.114	95% KM (BCA) UCL	2.919
95% KM (t) UCL	2.62	95% KM (Percentile Bootstrap) UCL	2.806
95% KM (z) UCL	2.58	95% KM Bootstrap t UCL	18.38
90% KM Chebyshev UCL	3.786	95% KM Chebyshev UCL	4.996
97.5% KM Chebyshev UCL	6.675	99% KM Chebyshev UCL	9.973

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.768	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.833	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.208	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.267	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)	0.281	k star (bias corrected MLE)	0.266
Theta hat (MLE)	11.79	Theta star (bias corrected MLE)	12.44
nu hat (MLE)	6.742	nu star (bias corrected)	6.39
Mean (detects)	3.313		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0037	Mean	1.111
Maximum	31	Median	0.01
SD	5.187	CV	4.668
k hat (MLE)	0.204	k star (bias corrected MLE)	0.205
Theta hat (MLE)	5.456	Theta star (bias corrected MLE)	5.414
nu hat (MLE)	14.66	nu star (bias corrected)	14.78
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (14.78, α)	7.105	Adjusted Chi Square Value (14.78, β)	6.864
95% Gamma Approximate UCL (use when n>=50)	2.31	95% Gamma Adjusted UCL (use when n<50)	2.392

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.116	SD (KM)	5.114
Variance (KM)	26.15	SE of Mean (KM)	0.89
k hat (KM)	0.0476	k star (KM)	0.0621
nu hat (KM)	3.426	nu star (KM)	4.474
theta hat (KM)	23.44	theta star (KM)	17.95
80% gamma percentile (KM)	0.297	90% gamma percentile (KM)	2.171
95% gamma percentile (KM)	6.298	99% gamma percentile (KM)	22.17

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.47, α)	0.918	Adjusted Chi Square Value (4.47, β)	0.849
95% Gamma Approximate KM-UCL (use when n>=50)	5.44	95% Gamma Adjusted KM-UCL (use when n<50)	5.88

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.987	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.118	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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	1.106	Mean in Log Scale	-4.747
SD in Original Scale	5.188	SD in Log Scale	3.034
95% t UCL (assumes normality of ROS data)	2.567	95% Percentile Bootstrap UCL	2.794
95% BCA Bootstrap UCL	4.408	95% Bootstrap t UCL	15.68
95% H-UCL (Log ROS)	13.01		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.833	KM Geo Mean	0.0216
KM SD (logged)	2.417	95% Critical H Value (KM-Log)	4.337
KM Standard Error of Mean (logged)	0.469	95% H-UCL (KM -Log)	2.365
KM SD (logged)	2.417	95% Critical H Value (KM-Log)	4.337
KM Standard Error of Mean (logged)	0.469		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.165	Mean in Log Scale	-2.686
SD in Original Scale	5.178	SD in Log Scale	2.042
95% t UCL (Assumes normality)	2.623	95% H-Stat UCL	2.019

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	5.88

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

beta-BHC (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	26
Number of Detects	8	Number of Non-Detects	28
Number of Distinct Detects	8	Number of Distinct Non-Detects	18
Minimum Detect	0.021	Minimum Non-Detect	0.0024
Maximum Detect	56	Maximum Non-Detect	2.3
Variance Detects	386.7	Percent Non-Detects	77.78%
Mean Detects	7.341	SD Detects	19.66
Median Detects	0.44	CV Detects	2.679
Skewness Detects	2.827	Kurtosis Detects	7.992
Mean of Logged Detects	-0.949	SD of Logged Detects	2.445

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.435	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.503	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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

KM Mean	1.638	KM Standard Error of Mean	1.638
KM SD	9.192	95% KM (BCA) UCL	4.755
95% KM (t) UCL	4.405	95% KM (Percentile Bootstrap) UCL	4.736
95% KM (z) UCL	4.331	95% KM Bootstrap t UCL	92.02
90% KM Chebyshev UCL	6.551	95% KM Chebyshev UCL	8.776
97.5% KM Chebyshev UCL	11.87	99% KM Chebyshev UCL	17.93

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.154	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.819	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.405	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.32	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)	0.243	k star (bias corrected MLE)	0.235
Theta hat (MLE)	30.26	Theta star (bias corrected MLE)	31.25
nu hat (MLE)	3.881	nu star (bias corrected)	3.759
Mean (detects)	7.341		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.639
Maximum	56	Median	0.01
SD	9.322	CV	5.687
k hat (MLE)	0.175	k star (bias corrected MLE)	0.179
Theta hat (MLE)	9.356	Theta star (bias corrected MLE)	9.151
nu hat (MLE)	12.61	nu star (bias corrected)	12.9
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (12.90, α)	5.823	Adjusted Chi Square Value (12.90, β)	5.608
95% Gamma Approximate UCL (use when n>=50)	3.63	95% Gamma Adjusted UCL (use when n<50)	3.77

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.638	SD (KM)	9.192
Variance (KM)	84.48	SE of Mean (KM)	1.638
k hat (KM)	0.0317	k star (KM)	0.0476
nu hat (KM)	2.286	nu star (KM)	3.429
theta hat (KM)	51.59	theta star (KM)	34.39
80% gamma percentile (KM)	0.186	90% gamma percentile (KM)	2.34
95% gamma percentile (KM)	8.55	99% gamma percentile (KM)	36.31

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.43, α)	0.51	Adjusted Chi Square Value (3.43, β)	0.465
95% Gamma Approximate KM-UCL (use when n>=50)	11.01	95% Gamma Adjusted KM-UCL (use when n<50)	12.07

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.235	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	1.632	Mean in Log Scale	-6.892
SD in Original Scale	9.323	SD in Log Scale	3.72
95% t UCL (assumes normality of ROS data)	4.257	95% Percentile Bootstrap UCL	4.732
95% BCA Bootstrap UCL	6.317	95% Bootstrap t UCL	110.1
95% H-UCL (Log ROS)	56.44		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.685	KM Geo Mean	0.00923
KM SD (logged)	2.387	95% Critical H Value (KM-Log)	4.291
KM Standard Error of Mean (logged)	0.464	95% H-UCL (KM -Log)	0.9
KM SD (logged)	2.387	95% Critical H Value (KM-Log)	4.291
KM Standard Error of Mean (logged)	0.464		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.688	Mean in Log Scale	-3.36
SD in Original Scale	9.315	SD in Log Scale	2.181
95% t UCL (Assumes normality)	4.311	95% H-Stat UCL	1.628

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

97.5% KM (Chebyshev) UCL	11.87

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.

beta-BHC (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	25
Number of Detects	4	Number of Non-Detects	32
Number of Distinct Detects	4	Number of Distinct Non-Detects	21
Minimum Detect	0.016	Minimum Non-Detect	0.0021
Maximum Detect	0.46	Maximum Non-Detect	2.1
Variance Detects	0.0465	Percent Non-Detects	88.89%
Mean Detects	0.238	SD Detects	0.216
Median Detects	0.237	CV Detects	0.908
Skewness Detects	0.00575	Kurtosis Detects	-4.717
Mean of Logged Detects	-2.061	SD of Logged Detects	1.553

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.03	KM Standard Error of Mean	0.0192
KM SD	0.098	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0624	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0616	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0876	95% KM Chebyshev UCL	0.114
97.5% KM Chebyshev UCL	0.15	99% KM Chebyshev UCL	0.221

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.348	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.668	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.297	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.403	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)	0.934	k star (bias corrected MLE)	0.4
Theta hat (MLE)	0.254	Theta star (bias corrected MLE)	0.594
nu hat (MLE)	7.469	nu star (bias corrected)	3.201
Mean (detects)	0.238		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0353
Maximum	0.46	Median	0.01
SD	0.0961	CV	2.725
k hat (MLE)	0.628	k star (bias corrected MLE)	0.594
Theta hat (MLE)	0.0562	Theta star (bias corrected MLE)	0.0594
nu hat (MLE)	45.19	nu star (bias corrected)	42.76
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (42.76, α)	28.77	Adjusted Chi Square Value (42.76, β)	28.24
95% Gamma Approximate UCL (use when n>=50)	0.0524	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.03	SD (KM)	0.098
Variance (KM)	0.0096	SE of Mean (KM)	0.0192
k hat (KM)	0.0936	k star (KM)	0.104
nu hat (KM)	6.74	nu star (KM)	7.512
theta hat (KM)	0.32	theta star (KM)	0.287
80% gamma percentile (KM)	0.0221	90% gamma percentile (KM)	0.0811
95% gamma percentile (KM)	0.174	99% gamma percentile (KM)	0.466

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.51, α)	2.456	Adjusted Chi Square Value (7.51, β)	2.326
95% Gamma Approximate KM-UCL (use when n>=50)	0.0917	95% Gamma Adjusted KM-UCL (use when n<50)	0.0968

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.259	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.0267	Mean in Log Scale	-7.951
SD in Original Scale	0.0985	SD in Log Scale	2.499
95% t UCL (assumes normality of ROS data)	0.0544	95% Percentile Bootstrap UCL	0.0562
95% BCA Bootstrap UCL	0.0751	95% Bootstrap t UCL	0.177
95% H-UCL (Log ROS)	0.0527		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.615	KM Geo Mean	0.00364
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	2.911
KM Standard Error of Mean (logged)	0.3	95% H-UCL (KM -Log)	0.0204
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	2.911
KM Standard Error of Mean (logged)	0.3		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0794	Mean in Log Scale	-4.263
SD in Original Scale	0.194	SD in Log Scale	1.854
95% t UCL (Assumes normality)	0.134	95% H-Stat UCL	0.236

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 0.0624

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 (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	31.5	Mean	444
Maximum	2360	Median	249.5
SD	514.4	Std. Error of Mean	85.74
Coefficient of Variation	1.159	Skewness	2.255

Normal GOF Test

Shapiro Wilk Test Statistic	0.728	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	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	588.8	95% Adjusted-CLT UCL (Chen-1995)	619.4
		95% Modified-t UCL (Johnson-1978)	594.2

Gamma GOF Test

A-D Test Statistic	0.596	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.775	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.137	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.151	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.061	k star (bias corrected MLE)	0.991
Theta hat (MLE)	418.4	Theta star (bias corrected MLE)	447.9
nu hat (MLE)	76.4	nu star (bias corrected)	71.37
MLE Mean (bias corrected)	444	MLE Sd (bias corrected)	445.9
		Approximate Chi Square Value (0.05)	52.92
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	52.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	598.7	95% Adjusted Gamma UCL (use when n<50)	607

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0861	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Lognormal Statistics

Minimum of Logged Data	3.45	Mean of logged Data	5.555
Maximum of Logged Data	7.766	SD of logged Data	1.083

Assuming Lognormal Distribution

95% H-UCL	732.1	90% Chebyshev (MVUE) UCL	744
95% Chebyshev (MVUE) UCL	875.5	97.5% Chebyshev (MVUE) UCL	1058
99% Chebyshev (MVUE) UCL	1417		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	585	95% Jackknife UCL	588.8
95% Standard Bootstrap UCL	587.4	95% Bootstrap-t UCL	652.8
95% Hall's Bootstrap UCL	667.3	95% Percentile Bootstrap UCL	594.9
95% BCA Bootstrap UCL	626.7		
90% Chebyshev(Mean, Sd) UCL	701.2	95% Chebyshev(Mean, Sd) UCL	817.7
97.5% Chebyshev(Mean, Sd) UCL	979.4	99% Chebyshev(Mean, Sd) UCL	1297

Suggested UCL to Use

95% Adjusted Gamma UCL 607

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 (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	6.98	Mean	151
Maximum	907	Median	64.45
SD	195	Std. Error of Mean	32.49
Coefficient of Variation	1.291	Skewness	2.177

Normal GOF Test

Shapiro Wilk Test Statistic	0.723	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	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	205.9	95% Adjusted-CLT UCL (Chen-1995)	217
		95% Modified-t UCL (Johnson-1978)	207.9

Gamma GOF Test

A-D Test Statistic	1.119	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.785	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.185	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.152	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.818	k star (bias corrected MLE)	0.768
Theta hat (MLE)	184.6	Theta star (bias corrected MLE)	196.5
nu hat (MLE)	58.89	nu star (bias corrected)	55.32
MLE Mean (bias corrected)	151	MLE Sd (bias corrected)	172.3
		Approximate Chi Square Value (0.05)	39.23
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	38.61

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	212.9	95% Adjusted Gamma UCL (use when n<50)	216.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.136	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.943	Mean of logged Data	4.294
Maximum of Logged Data	6.81	SD of logged Data	1.242

Assuming Lognormal Distribution

95% H-UCL	277.5	90% Chebyshev (MVUE) UCL	268.8
95% Chebyshev (MVUE) UCL	321.4	97.5% Chebyshev (MVUE) UCL	394.3
99% Chebyshev (MVUE) UCL	537.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	204.4	95% Jackknife UCL	205.9
95% Standard Bootstrap UCL	204.8	95% Bootstrap-t UCL	225.9
95% Hall's Bootstrap UCL	230.4	95% Percentile Bootstrap UCL	207.7
95% BCA Bootstrap UCL	222.8		
90% Chebyshev(Mean, Sd) UCL	248.5	95% Chebyshev(Mean, Sd) UCL	292.6
97.5% Chebyshev(Mean, Sd) UCL	353.9	99% Chebyshev(Mean, Sd) UCL	474.3

Suggested UCL to Use

95% H-UCL 277.5

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Copper (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	31.2	Mean	164.6
Maximum	629	Median	96.05
SD	167.8	Std. Error of Mean	27.97
Coefficient of Variation	1.02	Skewness	1.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.756	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.271	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	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	211.8	95% Adjusted-CLT UCL (Chen-1995)	218.3
		95% Modified-t UCL (Johnson-1978)	213

Gamma GOF Test

A-D Test Statistic	1.362	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.771	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.181	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.15	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma Statistics

k hat (MLE)	1.285	k star (bias corrected MLE)	1.197
Theta hat (MLE)	128	Theta star (bias corrected MLE)	137.5
nu hat (MLE)	92.54	nu star (bias corrected)	86.16
MLE Mean (bias corrected)	164.6	MLE Sd (bias corrected)	150.4
		Approximate Chi Square Value (0.05)	65.76
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	64.95

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	215.6	95% Adjusted Gamma UCL (use when n<50)	218.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.921	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.115	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.44	Mean of logged Data	4.666
Maximum of Logged Data	6.444	SD of logged Data	0.929

Assuming Lognormal Distribution

95% H-UCL	235	90% Chebyshev (MVUE) UCL	246.3
95% Chebyshev (MVUE) UCL	285	97.5% Chebyshev (MVUE) UCL	338.7
99% Chebyshev (MVUE) UCL	444.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	210.6	95% Jackknife UCL	211.8
95% Standard Bootstrap UCL	211.1	95% Bootstrap-t UCL	226.3
95% Hall's Bootstrap UCL	214.9	95% Percentile Bootstrap UCL	213
95% BCA Bootstrap UCL	216.2		
90% Chebyshev(Mean, Sd) UCL	248.5	95% Chebyshev(Mean, Sd) UCL	286.5
97.5% Chebyshev(Mean, Sd) UCL	339.2	99% Chebyshev(Mean, Sd) UCL	442.9

Suggested UCL to Use

95% H-UCL 235

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Copper (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	34
		Number of Missing Observations	0
Minimum	5.77	Mean	81.2
Maximum	750	Median	38.65
SD	144.3	Std. Error of Mean	24.05
Coefficient of Variation	1.777	Skewness	3.841

Normal GOF Test

Shapiro Wilk Test Statistic	0.467	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.33	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	121.8	95% Adjusted-CLT UCL (Chen-1995)	137.2
		95% Modified-t UCL (Johnson-1978)	124.4

Gamma GOF Test

A-D Test Statistic	2.69	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.78	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.152	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.918	k star (bias corrected MLE)	0.86
Theta hat (MLE)	88.49	Theta star (bias corrected MLE)	94.46
nu hat (MLE)	66.07	nu star (bias corrected)	61.9
MLE Mean (bias corrected)	81.2	MLE Sd (bias corrected)	87.58
		Approximate Chi Square Value (0.05)	44.8
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	44.14

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	112.2	95% Adjusted Gamma UCL (use when n<50)	113.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.149	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.753	Mean of logged Data	3.761
Maximum of Logged Data	6.62	SD of logged Data	0.989

Assuming Lognormal Distribution

95% H-UCL	104.3	90% Chebyshev (MVUE) UCL	108.2
95% Chebyshev (MVUE) UCL	126.1	97.5% Chebyshev (MVUE) UCL	150.8
99% Chebyshev (MVUE) UCL	199.5		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	120.8	95% Jackknife UCL	121.8
95% Standard Bootstrap UCL	120.6	95% Bootstrap-t UCL	214.1
95% Hall's Bootstrap UCL	310.2	95% Percentile Bootstrap UCL	120.2
95% BCA Bootstrap UCL	144.5		
90% Chebyshev(Mean, Sd) UCL	153.3	95% Chebyshev(Mean, Sd) UCL	186
97.5% Chebyshev(Mean, Sd) UCL	231.4	99% Chebyshev(Mean, Sd) UCL	320.5

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 186

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.

delta-BHC (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	19
Number of Detects	2	Number of Non-Detects	34
Number of Distinct Detects	2	Number of Distinct Non-Detects	17
Minimum Detect	0.057	Minimum Non-Detect	0.012
Maximum Detect	1.9	Maximum Non-Detect	0.25
Variance Detects	1.698	Percent Non-Detects	94.44%
Mean Detects	0.979	SD Detects	1.303
Median Detects	0.979	CV Detects	1.332
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.111	SD of Logged Detects	2.48

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

KM Mean	0.0665	KM Standard Error of Mean	0.0731
KM SD	0.31	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.19	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.187	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.286	95% KM Chebyshev UCL	0.385
97.5% KM Chebyshev UCL	0.523	99% KM Chebyshev UCL	0.794

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.571	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.713	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.285	nu star (bias corrected)	N/A
Mean (detects)	0.979		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0665	SD (KM)	0.31
Variance (KM)	0.0961	SE of Mean (KM)	0.0731
k hat (KM)	0.046	k star (KM)	0.0607
nu hat (KM)	3.315	nu star (KM)	4.372
theta hat (KM)	1.445	theta star (KM)	1.096
80% gamma percentile (KM)	0.0166	90% gamma percentile (KM)	0.127
95% gamma percentile (KM)	0.374	99% gamma percentile (KM)	1.335

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0428
Approximate Chi Square Value (4.37, α)	0.874	Adjusted Chi Square Value (4.37, β)	0.807
95% Gamma Approximate KM-UCL (use when n>=50)	0.333	95% Gamma Adjusted KM-UCL (use when n<50)	0.36

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

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	0.0544	Mean in Log Scale	-12.82
SD in Original Scale	0.317	SD in Log Scale	4.164
95% t UCL (assumes normality of ROS data)	0.144	95% Percentile Bootstrap UCL	0.16
95% BCA Bootstrap UCL	0.214	95% Bootstrap t UCL	51.02
95% H-UCL (Log ROS)	2.305		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.21	KM Geo Mean	0.0148
KM SD (logged)	0.883	95% Critical H Value (KM-Log)	2.255
KM Standard Error of Mean (logged)	0.217	95% H-UCL (KM -Log)	0.0307
KM SD (logged)	0.883	95% Critical H Value (KM-Log)	2.255
KM Standard Error of Mean (logged)	0.217		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0885	Mean in Log Scale	-3.47
SD in Original Scale	0.312	SD in Log Scale	1.05
95% t UCL (Assumes normality)	0.176	95% H-Stat UCL	0.0832

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	0.523

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.

delta-BHC (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	24

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (2) was not processed!

delta-BHC (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	2	Number of Non-Detects	34
Number of Distinct Detects	2	Number of Distinct Non-Detects	22
Minimum Detect	0.061	Minimum Non-Detect	0.0022
Maximum Detect	0.17	Maximum Non-Detect	4.9
Variance Detects	0.00594	Percent Non-Detects	94.44%
Mean Detects	0.116	SD Detects	0.0771
Median Detects	0.116	CV Detects	0.667
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.284	SD of Logged Detects	0.725

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

KM Mean	0.0105	KM Standard Error of Mean	0.00862
KM SD	0.0324	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.025	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0246	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0363	95% KM Chebyshev UCL	0.048
97.5% KM Chebyshev UCL	0.0643	99% KM Chebyshev UCL	0.0963

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	4.13	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.028	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	16.52	nu star (bias corrected)	N/A
Mean (detects)	0.116		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0105	SD (KM)	0.0324
Variance (KM)	0.00105	SE of Mean (KM)	0.00862
k hat (KM)	0.104	k star (KM)	0.114
nu hat (KM)	7.51	nu star (KM)	8.217
theta hat (KM)	0.1	theta star (KM)	0.0916
80% gamma percentile (KM)	0.00865	90% gamma percentile (KM)	0.0292
95% gamma percentile (KM)	0.06	99% gamma percentile (KM)	0.155

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0428
Approximate Chi Square Value (8.22, α)	2.861	Adjusted Chi Square Value (8.22, β)	2.719
95% Gamma Approximate KM-UCL (use when n>=50)	0.03	95% Gamma Adjusted KM-UCL (use when n<50)	0.0316

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	0.00933	Mean in Log Scale	-5.871
SD in Original Scale	0.0293	SD in Log Scale	1.175
95% t UCL (assumes normality of ROS data)	0.0176	95% Percentile Bootstrap UCL	0.0182
95% BCA Bootstrap UCL	0.0242	95% Bootstrap t UCL	0.086
95% H-UCL (Log ROS)	0.0094		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.83	KM Geo Mean	0.00294
KM SD (logged)	1.016	95% Critical H Value (KM-Log)	2.401
KM Standard Error of Mean (logged)	0.279	95% H-UCL (KM -Log)	0.00743
KM SD (logged)	1.016	95% Critical H Value (KM-Log)	2.401
KM Standard Error of Mean (logged)	0.279		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.137	Mean in Log Scale	-3.787
SD in Original Scale	0.44	SD in Log Scale	1.744
95% t UCL (Assumes normality)	0.261	95% H-Stat UCL	0.278

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 (Chebyshev) UCL	0.048

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.

delta-BHC (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	1	Number of Non-Detects	35
Number of Distinct Detects	1	Number of Distinct Non-Detects	23

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 delta-BHC (4) was not processed!

Dieldrin (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	28
Number of Detects	18	Number of Non-Detects	18
Number of Distinct Detects	16	Number of Distinct Non-Detects	15
Minimum Detect	0.05	Minimum Non-Detect	0.024
Maximum Detect	6.1	Maximum Non-Detect	0.5
Variance Detects	2.026	Percent Non-Detects	50%
Mean Detects	0.709	SD Detects	1.423
Median Detects	0.275	CV Detects	2.006
Skewness Detects	3.613	Kurtosis Detects	13.73
Mean of Logged Detects	-1.202	SD of Logged Detects	1.179

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.46	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.411	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.381	KM Standard Error of Mean	0.177
KM SD	1.033	95% KM (BCA) UCL	0.729
95% KM (t) UCL	0.68	95% KM (Percentile Bootstrap) UCL	0.707
95% KM (z) UCL	0.673	95% KM Bootstrap t UCL	1.741
90% KM Chebyshev UCL	0.913	95% KM Chebyshev UCL	1.154
97.5% KM Chebyshev UCL	1.488	99% KM Chebyshev UCL	2.144

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.437	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.782	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.268	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.212	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)	0.704	k star (bias corrected MLE)	0.623
Theta hat (MLE)	1.008	Theta star (bias corrected MLE)	1.138
nu hat (MLE)	25.33	nu star (bias corrected)	22.44
Mean (detects)	0.709		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.36
Maximum	6.1	Median	0.03
SD	1.053	CV	2.929
k hat (MLE)	0.356	k star (bias corrected MLE)	0.345
Theta hat (MLE)	1.009	Theta star (bias corrected MLE)	1.042
nu hat (MLE)	25.66	nu star (bias corrected)	24.86
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (24.86, α)	14.5	Adjusted Chi Square Value (24.86, β)	14.14
95% Gamma Approximate UCL (use when n>=50)	0.617	95% Gamma Adjusted UCL (use when n<50)	0.632

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.381	SD (KM)	1.033
Variance (KM)	1.066	SE of Mean (KM)	0.177
k hat (KM)	0.136	k star (KM)	0.143
nu hat (KM)	9.801	nu star (KM)	10.32
theta hat (KM)	2.799	theta star (KM)	2.659
80% gamma percentile (KM)	0.399	90% gamma percentile (KM)	1.122
95% gamma percentile (KM)	2.115	99% gamma percentile (KM)	5.024

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.32, α)	4.141	Adjusted Chi Square Value (10.32, β)	3.964
95% Gamma Approximate KM-UCL (use when n>=50)	0.949	95% Gamma Adjusted KM-UCL (use when n<50)	0.992

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.154	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.202	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	0.372	Mean in Log Scale	-2.369
SD in Original Scale	1.05	SD in Log Scale	1.495
95% t UCL (assumes normality of ROS data)	0.667	95% Percentile Bootstrap UCL	0.697
95% BCA Bootstrap UCL	0.91	95% Bootstrap t UCL	1.79
95% H-UCL (Log ROS)	0.61		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.241	KM Geo Mean	0.106
KM SD (logged)	1.412	95% Critical H Value (KM-Log)	2.89
KM Standard Error of Mean (logged)	0.261	95% H-UCL (KM -Log)	0.574
KM SD (logged)	1.412	95% Critical H Value (KM-Log)	2.89
KM Standard Error of Mean (logged)	0.261		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.397	Mean in Log Scale	-2.001
SD in Original Scale	1.042	SD in Log Scale	1.312
95% t UCL (Assumes normality)	0.691	95% H-Stat UCL	0.59

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

KM H-UCL 0.574

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Dieldrin (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	30
Number of Detects	12	Number of Non-Detects	24
Number of Distinct Detects	12	Number of Distinct Non-Detects	19
Minimum Detect	0.018	Minimum Non-Detect	0.024
Maximum Detect	24	Maximum Non-Detect	4.4
Variance Detects	49.08	Percent Non-Detects	66.67%
Mean Detects	3.17	SD Detects	7.005
Median Detects	0.5	CV Detects	2.21
Skewness Detects	2.862	Kurtosis Detects	8.394
Mean of Logged Detects	-0.775	SD of Logged Detects	2.168

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.513	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.428	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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

KM Mean	1.082	KM Standard Error of Mean	0.722
KM SD	4.145	95% KM (BCA) UCL	2.396
95% KM (t) UCL	2.301	95% KM (Percentile Bootstrap) UCL	2.369
95% KM (z) UCL	2.269	95% KM Bootstrap t UCL	12.75
90% KM Chebyshev UCL	3.247	95% KM Chebyshev UCL	4.228
97.5% KM Chebyshev UCL	5.589	99% KM Chebyshev UCL	8.262

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.74	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.814	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.259	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.264	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)	0.349	k star (bias corrected MLE)	0.317
Theta hat (MLE)	9.087	Theta star (bias corrected MLE)	9.994
nu hat (MLE)	8.371	nu star (bias corrected)	7.612
Mean (detects)	3.17		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.063
Maximum	24	Median	0.01
SD	4.208	CV	3.958
k hat (MLE)	0.215	k star (bias corrected MLE)	0.215
Theta hat (MLE)	4.952	Theta star (bias corrected MLE)	4.938
nu hat (MLE)	15.46	nu star (bias corrected)	15.5
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (15.50, α)	7.613	Adjusted Chi Square Value (15.50, β)	7.362
95% Gamma Approximate UCL (use when n>=50)	2.165	95% Gamma Adjusted UCL (use when n<50)	2.239

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.082	SD (KM)	4.145
Variance (KM)	17.18	SE of Mean (KM)	0.722
k hat (KM)	0.0682	k star (KM)	0.081
nu hat (KM)	4.909	nu star (KM)	5.833
theta hat (KM)	15.87	theta star (KM)	13.36
80% gamma percentile (KM)	0.528	90% gamma percentile (KM)	2.586
95% gamma percentile (KM)	6.296	99% gamma percentile (KM)	19.05

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.83, α)	1.555	Adjusted Chi Square Value (5.83, β)	1.458
95% Gamma Approximate KM-UCL (use when n>=50)	4.059	95% Gamma Adjusted KM-UCL (use when n<50)	4.33

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.126	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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	1.07	Mean in Log Scale	-3.025
SD in Original Scale	4.206	SD in Log Scale	2.102
95% t UCL (assumes normality of ROS data)	2.254	95% Percentile Bootstrap UCL	2.343
95% BCA Bootstrap UCL	3.064	95% Bootstrap t UCL	13.39
95% H-UCL (Log ROS)	1.747		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.687	KM Geo Mean	0.0681
KM SD (logged)	1.876	95% Critical H Value (KM-Log)	3.534
KM Standard Error of Mean (logged)	0.355	95% H-UCL (KM -Log)	1.212
KM SD (logged)	1.876	95% Critical H Value (KM-Log)	3.534
KM Standard Error of Mean (logged)	0.355		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.184	Mean in Log Scale	-1.937
SD in Original Scale	4.192	SD in Log Scale	1.761
95% t UCL (Assumes normality)	2.365	95% H-Stat UCL	1.854

DL/2 is not a recommended method, provided for comparisons and historical reasons

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	4.33

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.

Dieldrin (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	26
Number of Detects	10	Number of Non-Detects	26
Number of Distinct Detects	9	Number of Distinct Non-Detects	17
Minimum Detect	0.016	Minimum Non-Detect	0.0048
Maximum Detect	29	Maximum Non-Detect	4.5
Variance Detects	80.97	Percent Non-Detects	72.22%
Mean Detects	3.424	SD Detects	8.998
Median Detects	0.625	CV Detects	2.628
Skewness Detects	3.147	Kurtosis Detects	9.928
Mean of Logged Detects	-0.716	SD of Logged Detects	2.015

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.412	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.493	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	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

KM Mean	0.965	KM Standard Error of Mean	0.835
KM SD	4.751	95% KM (BCA) UCL	2.652
95% KM (t) UCL	2.375	95% KM (Percentile Bootstrap) UCL	2.527
95% KM (z) UCL	2.338	95% KM Bootstrap t UCL	15.98
90% KM Chebyshev UCL	3.469	95% KM Chebyshev UCL	4.603
97.5% KM Chebyshev UCL	6.178	99% KM Chebyshev UCL	9.271

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.11	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.805	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.362	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.286	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)	0.346	k star (bias corrected MLE)	0.309
Theta hat (MLE)	9.895	Theta star (bias corrected MLE)	11.08
nu hat (MLE)	6.921	nu star (bias corrected)	6.178
Mean (detects)	3.424		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.958
Maximum	29	Median	0.01
SD	4.819	CV	5.029
k hat (MLE)	0.21	k star (bias corrected MLE)	0.211
Theta hat (MLE)	4.569	Theta star (bias corrected MLE)	4.546
nu hat (MLE)	15.1	nu star (bias corrected)	15.18
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (15.18, α)	7.385	Adjusted Chi Square Value (15.18, β)	7.138
95% Gamma Approximate UCL (use when n>=50)	1.97	95% Gamma Adjusted UCL (use when n<50)	2.038

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.965	SD (KM)	4.751
Variance (KM)	22.57	SE of Mean (KM)	0.835
k hat (KM)	0.0412	k star (KM)	0.0563
nu hat (KM)	2.968	nu star (KM)	4.054
theta hat (KM)	23.4	theta star (KM)	17.13
80% gamma percentile (KM)	0.193	90% gamma percentile (KM)	1.697
95% gamma percentile (KM)	5.323	99% gamma percentile (KM)	19.99

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.05, α)	0.743	Adjusted Chi Square Value (4.05, β)	0.684
95% Gamma Approximate KM-UCL (use when n>=50)	5.263	95% Gamma Adjusted KM-UCL (use when n<50)	5.719

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.939	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	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	0.954	Mean in Log Scale	-4.671
SD in Original Scale	4.82	SD in Log Scale	2.882
95% t UCL (assumes normality of ROS data)	2.311	95% Percentile Bootstrap UCL	2.545
95% BCA Bootstrap UCL	3.438	95% Bootstrap t UCL	17.63
95% H-UCL (Log ROS)	6.959		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.799	KM Geo Mean	0.0224
KM SD (logged)	2.278	95% Critical H Value (KM-Log)	4.127
KM Standard Error of Mean (logged)	0.44	95% H-UCL (KM -Log)	1.471
KM SD (logged)	2.278	95% Critical H Value (KM-Log)	4.127
KM Standard Error of Mean (logged)	0.44		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.059	Mean in Log Scale	-2.607
SD in Original Scale	4.814	SD in Log Scale	2.037
95% t UCL (Assumes normality)	2.414	95% H-Stat UCL	2.151

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

97.5% KM (Chebyshev) UCL	6.178

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.

Dieldrin (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	29
Number of Detects	3	Number of Non-Detects	33
Number of Distinct Detects	3	Number of Distinct Non-Detects	26
Minimum Detect	0.15	Minimum Non-Detect	0.0041
Maximum Detect	15	Maximum Non-Detect	4.2
Variance Detects	69.11	Percent Non-Detects	91.67%
Mean Detects	5.417	SD Detects	8.313
Median Detects	1.1	CV Detects	1.535
Skewness Detects	1.707	Kurtosis Detects	N/A
Mean of Logged Detects	0.302	SD of Logged Detects	2.31

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	0.798	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.365	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.457	KM Standard Error of Mean	0.503
KM SD	2.465	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.307	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.285	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.967	95% KM Chebyshev UCL	2.651
97.5% KM Chebyshev UCL	3.6	99% KM Chebyshev UCL	5.464

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.463	k star (bias corrected MLE)	N/A
Theta hat (MLE)	11.69	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.78	nu star (bias corrected)	N/A
Mean (detects)	5.417		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.461
Maximum	15	Median	0.01
SD	2.499	CV	5.426
k hat (MLE)	0.213	k star (bias corrected MLE)	0.214
Theta hat (MLE)	2.162	Theta star (bias corrected MLE)	2.154
nu hat (MLE)	15.34	nu star (bias corrected)	15.39
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (15.39, α)	7.535	Adjusted Chi Square Value (15.39, β)	7.285
95% Gamma Approximate UCL (use when n>=50)	0.941	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.457	SD (KM)	2.465
Variance (KM)	6.076	SE of Mean (KM)	0.503
k hat (KM)	0.0344	k star (KM)	0.05
nu hat (KM)	2.476	nu star (KM)	3.603
theta hat (KM)	13.29	theta star (KM)	9.135
80% gamma percentile (KM)	0.0622	90% gamma percentile (KM)	0.698
95% gamma percentile (KM)	2.432	99% gamma percentile (KM)	9.94

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.60, α)	0.571	Adjusted Chi Square Value (3.60, β)	0.522
95% Gamma Approximate KM-UCL (use when n>=50)	2.882	95% Gamma Adjusted KM-UCL (use when n<50)	3.152

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.994	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.202	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.451	Mean in Log Scale	-10.25
SD in Original Scale	2.501	SD in Log Scale	3.641
95% t UCL (assumes normality of ROS data)	1.156	95% Percentile Bootstrap UCL	1.281
95% BCA Bootstrap UCL	2.083	95% Bootstrap t UCL	45.21
95% H-UCL (Log ROS)	1.251		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.983	KM Geo Mean	0.00685
KM SD (logged)	1.718	95% Critical H Value (KM-Log)	3.31
KM Standard Error of Mean (logged)	0.359	95% H-UCL (KM -Log)	0.0785
KM SD (logged)	1.718	95% Critical H Value (KM-Log)	3.31
KM Standard Error of Mean (logged)	0.359		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.557	Mean in Log Scale	-3.519
SD in Original Scale	2.506	SD in Log Scale	2.068
95% t UCL (Assumes normality)	1.263	95% H-Stat UCL	0.955

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	1.307

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.

gamma-BHC (Lindane) (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	22
Number of Detects	5	Number of Non-Detects	31
Number of Distinct Detects	5	Number of Distinct Non-Detects	17
Minimum Detect	0.031	Minimum Non-Detect	0.012
Maximum Detect	0.99	Maximum Non-Detect	0.25
Variance Detects	0.17	Percent Non-Detects	86.11%
Mean Detects	0.254	SD Detects	0.413
Median Detects	0.061	CV Detects	1.623
Skewness Detects	2.194	Kurtosis Detects	4.841
Mean of Logged Detects	-2.227	SD of Logged Detects	1.339

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.628	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.418	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.0486	KM Standard Error of Mean	0.0301
KM SD	0.161	95% KM (BCA) UCL	0.129
95% KM (t) UCL	0.0995	95% KM (Percentile Bootstrap) UCL	0.106
95% KM (z) UCL	0.0981	95% KM Bootstrap t UCL	0.232
90% KM Chebyshev UCL	0.139	95% KM Chebyshev UCL	0.18
97.5% KM Chebyshev UCL	0.237	99% KM Chebyshev UCL	0.348

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.692	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.336	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.368	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)	0.704	k star (bias corrected MLE)	0.415
Theta hat (MLE)	0.361	Theta star (bias corrected MLE)	0.613
nu hat (MLE)	7.038	nu star (bias corrected)	4.149
Mean (detects)	0.254		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0439
Maximum	0.99	Median	0.01
SD	0.164	CV	3.727
k hat (MLE)	0.545	k star (bias corrected MLE)	0.518
Theta hat (MLE)	0.0806	Theta star (bias corrected MLE)	0.0848
nu hat (MLE)	39.24	nu star (bias corrected)	37.31
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (37.31, α)	24.32	Adjusted Chi Square Value (37.31, β)	23.85
95% Gamma Approximate UCL (use when n>=50)	0.0674	95% Gamma Adjusted UCL (use when n<50)	0.0688

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0486	SD (KM)	0.161
Variance (KM)	0.0259	SE of Mean (KM)	0.0301
k hat (KM)	0.0913	k star (KM)	0.102
nu hat (KM)	6.576	nu star (KM)	7.361
theta hat (KM)	0.532	theta star (KM)	0.476
80% gamma percentile (KM)	0.0348	90% gamma percentile (KM)	0.131
95% gamma percentile (KM)	0.282	99% gamma percentile (KM)	0.764

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.36, α)	2.371	Adjusted Chi Square Value (7.36, β)	2.244
95% Gamma Approximate KM-UCL (use when n>=50)	0.151	95% Gamma Adjusted KM-UCL (use when n<50)	0.159

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.265	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	0.0381	Mean in Log Scale	-5.83
SD in Original Scale	0.165	SD in Log Scale	1.858
95% t UCL (assumes normality of ROS data)	0.0846	95% Percentile Bootstrap UCL	0.093
95% BCA Bootstrap UCL	0.125	95% Bootstrap t UCL	0.408
95% H-UCL (Log ROS)	0.0497		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.004	KM Geo Mean	0.0182
KM SD (logged)	0.919	95% Critical H Value (KM-Log)	2.293
KM Standard Error of Mean (logged)	0.196	95% H-UCL (KM -Log)	0.0397
KM SD (logged)	0.919	95% Critical H Value (KM-Log)	2.293
KM Standard Error of Mean (logged)	0.196		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.067	Mean in Log Scale	-3.408
SD in Original Scale	0.161	SD in Log Scale	0.994
95% t UCL (Assumes normality)	0.112	95% H-Stat UCL	0.0809

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.159

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.

gamma-BHC (Lindane) (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	2	Number of Non-Detects	34
Number of Distinct Detects	2	Number of Distinct Non-Detects	23
Minimum Detect	0.11	Minimum Non-Detect	0.002
Maximum Detect	0.44	Maximum Non-Detect	3.8
Variance Detects	0.0545	Percent Non-Detects	94.44%
Mean Detects	0.275	SD Detects	0.233
Median Detects	0.275	CV Detects	0.849
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.514	SD of Logged Detects	0.98

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

KM Mean	0.0191	KM Standard Error of Mean	0.0187
KM SD	0.0762	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0507	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0498	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0752	95% KM Chebyshev UCL	0.101
97.5% KM Chebyshev UCL	0.136	99% KM Chebyshev UCL	0.205

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.394	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.115	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.577	nu star (bias corrected)	N/A
Mean (detects)	0.275		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0191	SD (KM)	0.0762
Variance (KM)	0.0058	SE of Mean (KM)	0.0187
k hat (KM)	0.0627	k star (KM)	0.076
nu hat (KM)	4.514	nu star (KM)	5.471
theta hat (KM)	0.304	theta star (KM)	0.251
80% gamma percentile (KM)	0.00818	90% gamma percentile (KM)	0.0437
95% gamma percentile (KM)	0.111	99% gamma percentile (KM)	0.346

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0428
Approximate Chi Square Value (5.47, α)	1.376	Adjusted Chi Square Value (5.47, β)	1.286
95% Gamma Approximate KM-UCL (use when n>=50)	0.0759	95% Gamma Adjusted KM-UCL (use when n<50)	0.0812

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

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	0.0169	Mean in Log Scale	-6.515
SD in Original Scale	0.0748	SD in Log Scale	1.571
95% t UCL (assumes normality of ROS data)	0.038	95% Percentile Bootstrap UCL	0.0413
95% BCA Bootstrap UCL	0.0563	95% Bootstrap t UCL	0.662
95% H-UCL (Log ROS)	0.0116		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.9	KM Geo Mean	0.00274
KM SD (logged)	1.175	95% Critical H Value (KM-Log)	2.589
KM Standard Error of Mean (logged)	0.304	95% H-UCL (KM -Log)	0.00913
KM SD (logged)	1.175	95% Critical H Value (KM-Log)	2.589
KM Standard Error of Mean (logged)	0.304		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.138	Mean in Log Scale	-3.303
SD in Original Scale	0.357	SD in Log Scale	1.553
95% t UCL (Assumes normality)	0.239	95% H-Stat UCL	0.275

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 (Chebyshev) UCL	0.101

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.

gamma-BHC (Lindane) (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	2	Number of Non-Detects	34
Number of Distinct Detects	2	Number of Distinct Non-Detects	22
Minimum Detect	0.064	Minimum Non-Detect	0.0022
Maximum Detect	0.15	Maximum Non-Detect	4.9
Variance Detects	0.0037	Percent Non-Detects	94.44%
Mean Detects	0.107	SD Detects	0.0608
Median Detects	0.107	CV Detects	0.568
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.323	SD of Logged Detects	0.602

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

KM Mean	0.00989	KM Standard Error of Mean	0.00782
KM SD	0.0292	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0231	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0228	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0334	95% KM Chebyshev UCL	0.044
97.5% KM Chebyshev UCL	0.0588	99% KM Chebyshev UCL	0.0877

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	5.839	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0183	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	23.36	nu star (bias corrected)	N/A
Mean (detects)	0.107		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00989	SD (KM)	0.0292
Variance (KM)	8.5445E-4	SE of Mean (KM)	0.00782
k hat (KM)	0.114	k star (KM)	0.123
nu hat (KM)	8.244	nu star (KM)	8.89
theta hat (KM)	0.0864	theta star (KM)	0.0801
80% gamma percentile (KM)	0.00895	90% gamma percentile (KM)	0.0282
95% gamma percentile (KM)	0.0562	99% gamma percentile (KM)	0.141

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0428
Approximate Chi Square Value (8.89, α)	3.261	Adjusted Chi Square Value (8.89, β)	3.107
95% Gamma Approximate KM-UCL (use when n>=50)	0.027	95% Gamma Adjusted KM-UCL (use when n<50)	0.0283

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	0.0108	Mean in Log Scale	-5.304
SD in Original Scale	0.026	SD in Log Scale	0.976
95% t UCL (assumes normality of ROS data)	0.0181	95% Percentile Bootstrap UCL	0.0188
95% BCA Bootstrap UCL	0.0232	95% Bootstrap t UCL	0.0544
95% H-UCL (Log ROS)	0.0118		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.832	KM Geo Mean	0.00293
KM SD (logged)	1.005	95% Critical H Value (KM-Log)	2.388
KM Standard Error of Mean (logged)	0.276	95% H-UCL (KM -Log)	0.00728
KM SD (logged)	1.005	95% Critical H Value (KM-Log)	2.388
KM Standard Error of Mean (logged)	0.276		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.137	Mean in Log Scale	-3.789
SD in Original Scale	0.44	SD in Log Scale	1.741
95% t UCL (Assumes normality)	0.26	95% H-Stat UCL	0.275

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 (Chebyshev) UCL	0.044

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.

gamma-BHC (Lindane) (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	23

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (4) was not processed!

gamma-Chlordane (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	12	Number of Non-Detects	24
Number of Distinct Detects	10	Number of Distinct Non-Detects	17
Minimum Detect	0.029	Minimum Non-Detect	0.012
Maximum Detect	0.61	Maximum Non-Detect	0.25
Variance Detects	0.0232	Percent Non-Detects	66.67%
Mean Detects	0.156	SD Detects	0.152
Median Detects	0.125	CV Detects	0.978
Skewness Detects	2.76	Kurtosis Detects	8.661
Mean of Logged Detects	-2.16	SD of Logged Detects	0.786

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.656	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.322	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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

KM Mean	0.0651	KM Standard Error of Mean	0.019
KM SD	0.107	95% KM (BCA) UCL	0.106
95% KM (t) UCL	0.0972	95% KM (Percentile Bootstrap) UCL	0.0994
95% KM (z) UCL	0.0964	95% KM Bootstrap t UCL	0.116
90% KM Chebyshev UCL	0.122	95% KM Chebyshev UCL	0.148
97.5% KM Chebyshev UCL	0.184	99% KM Chebyshev UCL	0.254

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.567	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.22	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.249	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)	1.819	k star (bias corrected MLE)	1.42
Theta hat (MLE)	0.0855	Theta star (bias corrected MLE)	0.11
nu hat (MLE)	43.66	nu star (bias corrected)	34.08
Mean (detects)	0.156		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0585
Maximum	0.61	Median	0.01
SD	0.11	CV	1.881
k hat (MLE)	0.643	k star (bias corrected MLE)	0.608
Theta hat (MLE)	0.0911	Theta star (bias corrected MLE)	0.0963
nu hat (MLE)	46.27	nu star (bias corrected)	43.75
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (43.75, α)	29.58	Adjusted Chi Square Value (43.75, β)	29.05
95% Gamma Approximate UCL (use when n>=50)	0.0866	95% Gamma Adjusted UCL (use when n<50)	0.0881

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0651	SD (KM)	0.107
Variance (KM)	0.0115	SE of Mean (KM)	0.019
k hat (KM)	0.368	k star (KM)	0.356
nu hat (KM)	26.48	nu star (KM)	25.6
theta hat (KM)	0.177	theta star (KM)	0.183
80% gamma percentile (KM)	0.103	90% gamma percentile (KM)	0.188
95% gamma percentile (KM)	0.282	99% gamma percentile (KM)	0.521

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.60, α)	15.07	Adjusted Chi Square Value (25.60, β)	14.71
95% Gamma Approximate KM-UCL (use when n>=50)	0.111	95% Gamma Adjusted KM-UCL (use when n<50)	0.113

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	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	0.0643	Mean in Log Scale	-3.441
SD in Original Scale	0.108	SD in Log Scale	1.081
95% t UCL (assumes normality of ROS data)	0.0946	95% Percentile Bootstrap UCL	0.0967
95% BCA Bootstrap UCL	0.112	95% Bootstrap t UCL	0.125
95% H-UCL (Log ROS)	0.0902		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.506	KM Geo Mean	0.03
KM SD (logged)	1.146	95% Critical H Value (KM-Log)	2.554
KM Standard Error of Mean (logged)	0.222	95% H-UCL (KM -Log)	0.095
KM SD (logged)	1.146	95% Critical H Value (KM-Log)	2.554
KM Standard Error of Mean (logged)	0.222		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0776	Mean in Log Scale	-3.104
SD in Original Scale	0.105	SD in Log Scale	1.057
95% t UCL (Assumes normality)	0.107	95% H-Stat UCL	0.122

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 Adjusted Gamma UCL	0.113	95% GROS Adjusted Gamma UCL	0.0881

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.

gamma-Chlordane (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	27
Number of Detects	14	Number of Non-Detects	22
Number of Distinct Detects	14	Number of Distinct Non-Detects	15
Minimum Detect	0.016	Minimum Non-Detect	0.01
Maximum Detect	17	Maximum Non-Detect	0.24
Variance Detects	20.51	Percent Non-Detects	61.11%
Mean Detects	2.241	SD Detects	4.529
Median Detects	0.25	CV Detects	2.021
Skewness Detects	3.04	Kurtosis Detects	10.03
Mean of Logged Detects	-1.1	SD of Logged Detects	2.224

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.55	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.226	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

KM Mean	0.884	KM Standard Error of Mean	0.507
KM SD	2.929	95% KM (BCA) UCL	1.952
95% KM (t) UCL	1.74	95% KM (Percentile Bootstrap) UCL	1.773
95% KM (z) UCL	1.717	95% KM Bootstrap t UCL	3.423
90% KM Chebyshev UCL	2.404	95% KM Chebyshev UCL	3.092
97.5% KM Chebyshev UCL	4.048	99% KM Chebyshev UCL	5.925

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.759	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.822	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.233	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.246	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)	0.352	k star (bias corrected MLE)	0.324
Theta hat (MLE)	6.362	Theta star (bias corrected MLE)	6.909
nu hat (MLE)	9.863	nu star (bias corrected)	9.083
Mean (detects)	2.241		

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.878
Maximum	17	Median	0.01
SD	2.972	CV	3.387
k hat (MLE)	0.231	k star (bias corrected MLE)	0.23
Theta hat (MLE)	3.796	Theta star (bias corrected MLE)	3.809
nu hat (MLE)	16.64	nu star (bias corrected)	16.59
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (16.59, α)	8.38	Adjusted Chi Square Value (16.59, β)	8.115
95% Gamma Approximate UCL (use when n>=50)	1.737	95% Gamma Adjusted UCL (use when n<50)	1.794

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.884	SD (KM)	2.929
Variance (KM)	8.579	SE of Mean (KM)	0.507
k hat (KM)	0.0911	k star (KM)	0.102
nu hat (KM)	6.559	nu star (KM)	7.346
theta hat (KM)	9.704	theta star (KM)	8.665
80% gamma percentile (KM)	0.631	90% gamma percentile (KM)	2.372
95% gamma percentile (KM)	5.125	99% gamma percentile (KM)	13.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.35, α)	2.362	Adjusted Chi Square Value (7.35, β)	2.236
95% Gamma Approximate KM-UCL (use when n>=50)	2.749	95% Gamma Adjusted KM-UCL (use when n<50)	2.904

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.164	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.226	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	0.876	Mean in Log Scale	-3.89
SD in Original Scale	2.973	SD in Log Scale	2.792
95% t UCL (assumes normality of ROS data)	1.713	95% Percentile Bootstrap UCL	1.745
95% BCA Bootstrap UCL	2.441	95% Bootstrap t UCL	3.328
95% H-UCL (Log ROS)	10.21		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.948	KM Geo Mean	0.0524
KM SD (logged)	2.042	95% Critical H Value (KM-Log)	3.777
KM Standard Error of Mean (logged)	0.374	95% H-UCL (KM -Log)	1.555
KM SD (logged)	2.042	95% Critical H Value (KM-Log)	3.777
KM Standard Error of Mean (logged)	0.374		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.903	Mean in Log Scale	-2.517
SD in Original Scale	2.965	SD in Log Scale	1.95
95% t UCL (Assumes normality)	1.738	95% H-Stat UCL	1.795

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	2.904

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.

gamma-Chlordane (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	26
Number of Detects	8	Number of Non-Detects	28
Number of Distinct Detects	8	Number of Distinct Non-Detects	18
Minimum Detect	0.019	Minimum Non-Detect	0.0024
Maximum Detect	69	Maximum Non-Detect	2.3
Variance Detects	583.3	Percent Non-Detects	77.78%
Mean Detects	9.24	SD Detects	24.15
Median Detects	0.875	CV Detects	2.614
Skewness Detects	2.826	Kurtosis Detects	7.989
Mean of Logged Detects	-0.334	SD of Logged Detects	2.366

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.439	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.499	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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

KM Mean	2.061	KM Standard Error of Mean	2.017
KM SD	11.32	95% KM (BCA) UCL	5.902
95% KM (t) UCL	5.469	95% KM (Percentile Bootstrap) UCL	5.876
95% KM (z) UCL	5.379	95% KM Bootstrap t UCL	83.72
90% KM Chebyshev UCL	8.113	95% KM Chebyshev UCL	10.85
97.5% KM Chebyshev UCL	14.66	99% KM Chebyshev UCL	22.13

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.105	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.807	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.399	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.319	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)	0.274	k star (bias corrected MLE)	0.254
Theta hat (MLE)	33.76	Theta star (bias corrected MLE)	36.32
nu hat (MLE)	4.379	nu star (bias corrected)	4.07
Mean (detects)	9.24		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.061
Maximum	69	Median	0.01
SD	11.48	CV	5.57
k hat (MLE)	0.172	k star (bias corrected MLE)	0.176
Theta hat (MLE)	11.98	Theta star (bias corrected MLE)	11.7
nu hat (MLE)	12.38	nu star (bias corrected)	12.68
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (12.68, α)	5.681	Adjusted Chi Square Value (12.68, β)	5.468
95% Gamma Approximate UCL (use when n>=50)	4.602	95% Gamma Adjusted UCL (use when n<50)	4.781

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.061	SD (KM)	11.32
Variance (KM)	128.2	SE of Mean (KM)	2.017
k hat (KM)	0.0332	k star (KM)	0.0489
nu hat (KM)	2.388	nu star (KM)	3.522
theta hat (KM)	62.17	theta star (KM)	42.14
80% gamma percentile (KM)	0.259	90% gamma percentile (KM)	3.056
95% gamma percentile (KM)	10.88	99% gamma percentile (KM)	45.23

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.52, α)	0.542	Adjusted Chi Square Value (3.52, β)	0.496
95% Gamma Approximate KM-UCL (use when n>=50)	13.38	95% Gamma Adjusted KM-UCL (use when n<50)	14.65

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.918	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.242	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	2.054	Mean in Log Scale	-6.172
SD in Original Scale	11.48	SD in Log Scale	3.64
95% t UCL (assumes normality of ROS data)	5.288	95% Percentile Bootstrap UCL	5.885
95% BCA Bootstrap UCL	7.842	95% Bootstrap t UCL	92.6
95% H-UCL (Log ROS)	73.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.552	KM Geo Mean	0.0105
KM SD (logged)	2.592	95% Critical H Value (KM-Log)	4.603
KM Standard Error of Mean (logged)	0.503	95% H-UCL (KM -Log)	2.281
KM SD (logged)	2.592	95% Critical H Value (KM-Log)	4.603
KM Standard Error of Mean (logged)	0.503		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.11	Mean in Log Scale	-3.223
SD in Original Scale	11.47	SD in Log Scale	2.33
95% t UCL (Assumes normality)	5.341	95% H-Stat UCL	3.145

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

97.5% KM (Chebyshev) UCL	14.66

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.

gamma-Chlordane (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	3	Number of Non-Detects	33
Number of Distinct Detects	3	Number of Distinct Non-Detects	22
Minimum Detect	0.035	Minimum Non-Detect	0.0021
Maximum Detect	0.56	Maximum Non-Detect	2.1
Variance Detects	0.0709	Percent Non-Detects	91.67%
Mean Detects	0.272	SD Detects	0.266
Median Detects	0.22	CV Detects	0.98
Skewness Detects	0.84	Kurtosis Detects	N/A
Mean of Logged Detects	-1.815	SD of Logged Detects	1.411

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.972	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0263	KM Standard Error of Mean	0.0208
KM SD	0.0994	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0615	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0605	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0887	95% KM Chebyshev UCL	0.117
97.5% KM Chebyshev UCL	0.156	99% KM Chebyshev UCL	0.233

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.113	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.244	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.679	nu star (bias corrected)	N/A
Mean (detects)	0.272		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0318
Maximum	0.56	Median	0.01
SD	0.0971	CV	3.053
k hat (MLE)	0.659	k star (bias corrected MLE)	0.623
Theta hat (MLE)	0.0482	Theta star (bias corrected MLE)	0.0511
nu hat (MLE)	47.46	nu star (bias corrected)	44.84
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (44.84, α)	30.48	Adjusted Chi Square Value (44.84, β)	29.94
95% Gamma Approximate UCL (use when n>=50)	0.0468	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0263	SD (KM)	0.0994
Variance (KM)	0.00988	SE of Mean (KM)	0.0208
k hat (KM)	0.0701	k star (KM)	0.0828
nu hat (KM)	5.051	nu star (KM)	5.963
theta hat (KM)	0.375	theta star (KM)	0.318
80% gamma percentile (KM)	0.0134	90% gamma percentile (KM)	0.0638
95% gamma percentile (KM)	0.153	99% gamma percentile (KM)	0.459

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.96, α)	1.621	Adjusted Chi Square Value (5.96, β)	1.521
95% Gamma Approximate KM-UCL (use when n>=50)	0.0969	95% Gamma Adjusted KM-UCL (use when n<50)	0.103

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.251	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.0232	Mean in Log Scale	-7.613
SD in Original Scale	0.0991	SD in Log Scale	2.144
95% t UCL (assumes normality of ROS data)	0.0511	95% Percentile Bootstrap UCL	0.0534
95% BCA Bootstrap UCL	0.075	95% Bootstrap t UCL	0.397
95% H-UCL (Log ROS)	0.0204		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.75	KM Geo Mean	0.00318
KM SD (logged)	1.31	95% Critical H Value (KM-Log)	2.758
KM Standard Error of Mean (logged)	0.285	95% H-UCL (KM -Log)	0.0138
KM SD (logged)	1.31	95% Critical H Value (KM-Log)	2.758
KM Standard Error of Mean (logged)	0.285		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0759	Mean in Log Scale	-4.323
SD in Original Scale	0.195	SD in Log Scale	1.82
95% t UCL (Assumes normality)	0.131	95% H-Stat UCL	0.201

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 0.0615

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.

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Heptachlor (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	18
Number of Detects	1	Number of Non-Detects	35
Number of Distinct Detects	1	Number of Distinct Non-Detects	18

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 Heptachlor (1) was not processed!

Heptachlor (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	25
Number of Detects	4	Number of Non-Detects	32
Number of Distinct Detects	4	Number of Distinct Non-Detects	21
Minimum Detect	0.012	Minimum Non-Detect	0.002
Maximum Detect	21	Maximum Non-Detect	2.2
Variance Detects	100.7	Percent Non-Detects	88.89%
Mean Detects	6.058	SD Detects	10.04
Median Detects	1.61	CV Detects	1.657
Skewness Detects	1.913	Kurtosis Detects	3.68
Mean of Logged Detects	-0.304	SD of Logged Detects	3.177

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.727	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.377	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.677	KM Standard Error of Mean	0.667
KM SD	3.466	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.804	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.774	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	2.678	95% KM Chebyshev UCL	3.585
97.5% KM Chebyshev UCL	4.843	99% KM Chebyshev UCL	7.314

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.203	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.174	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.417	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)	0.324	k star (bias corrected MLE)	0.248
Theta hat (MLE)	18.73	Theta star (bias corrected MLE)	24.47
nu hat (MLE)	2.588	nu star (bias corrected)	1.98
Mean (detects)	6.058		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.682
Maximum	21	Median	0.01
SD	3.514	CV	5.153
k hat (MLE)	0.197	k star (bias corrected MLE)	0.199
Theta hat (MLE)	3.462	Theta star (bias corrected MLE)	3.425
nu hat (MLE)	14.18	nu star (bias corrected)	14.34
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (14.34, α)	6.801	Adjusted Chi Square Value (14.34, β)	6.566
95% Gamma Approximate UCL (use when n>=50)	1.437	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.677	SD (KM)	3.466
Variance (KM)	12.01	SE of Mean (KM)	0.667
k hat (KM)	0.0382	k star (KM)	0.0535
nu hat (KM)	2.749	nu star (KM)	3.853
theta hat (KM)	17.74	theta star (KM)	12.66
80% gamma percentile (KM)	0.116	90% gamma percentile (KM)	1.125
95% gamma percentile (KM)	3.684	99% gamma percentile (KM)	14.33

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.85, α)	0.665	Adjusted Chi Square Value (3.85, β)	0.61
95% Gamma Approximate KM-UCL (use when n>=50)	3.927	95% Gamma Adjusted KM-UCL (use when n<50)	4.279

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.673	Mean in Log Scale	-9.296
SD in Original Scale	3.516	SD in Log Scale	3.995
95% t UCL (assumes normality of ROS data)	1.664	95% Percentile Bootstrap UCL	1.828
95% BCA Bootstrap UCL	3.006	95% Bootstrap t UCL	33.92
95% H-UCL (Log ROS)	26.55		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.193	KM Geo Mean	0.00556
KM SD (logged)	2.085	95% Critical H Value (KM-Log)	3.84
KM Standard Error of Mean (logged)	0.556	95% H-UCL (KM -Log)	0.189
KM SD (logged)	2.085	95% Critical H Value (KM-Log)	3.84
KM Standard Error of Mean (logged)	0.556		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.743	Mean in Log Scale	-3.141
SD in Original Scale	3.507	SD in Log Scale	1.883
95% t UCL (Assumes normality)	1.73	95% H-Stat UCL	0.788

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

ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	4.279

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.

Heptachlor (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	3	Number of Non-Detects	33
Number of Distinct Detects	3	Number of Distinct Non-Detects	21
Minimum Detect	0.13	Minimum Non-Detect	0.0022
Maximum Detect	41	Maximum Non-Detect	2.3
Variance Detects	553.1	Percent Non-Detects	91.67%
Mean Detects	13.84	SD Detects	23.52
Median Detects	0.4	CV Detects	1.699
Skewness Detects	1.732	Kurtosis Detects	N/A
Mean of Logged Detects	0.252	SD of Logged Detects	3.05

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	0.755	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.383	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	1.157	KM Standard Error of Mean	1.375
KM SD	6.735	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.48	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.418	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	5.281	95% KM Chebyshev UCL	7.149
97.5% KM Chebyshev UCL	9.742	99% KM Chebyshev UCL	14.84

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.292	k star (bias corrected MLE)	N/A
Theta hat (MLE)	47.47	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.75	nu star (bias corrected)	N/A
Mean (detects)	13.84		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.163
Maximum	41	Median	0.01
SD	6.83	CV	5.873
k hat (MLE)	0.173	k star (bias corrected MLE)	0.177
Theta hat (MLE)	6.723	Theta star (bias corrected MLE)	6.567
nu hat (MLE)	12.45	nu star (bias corrected)	12.75
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (12.75, α)	5.724	Adjusted Chi Square Value (12.75, β)	5.51
95% Gamma Approximate UCL (use when n>=50)	2.59	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.157	SD (KM)	6.735
Variance (KM)	45.36	SE of Mean (KM)	1.375
k hat (KM)	0.0295	k star (KM)	0.0456
nu hat (KM)	2.124	nu star (KM)	3.28
theta hat (KM)	39.22	theta star (KM)	25.39
80% gamma percentile (KM)	0.111	90% gamma percentile (KM)	1.551
95% gamma percentile (KM)	5.927	99% gamma percentile (KM)	26.08

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.28, α)	0.46	Adjusted Chi Square Value (3.28, β)	0.419
95% Gamma Approximate KM-UCL (use when n>=50)	8.248	95% Gamma Adjusted KM-UCL (use when n<50)	9.061
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.89	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.316	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	1.154	Mean in Log Scale	-13.58
SD in Original Scale	6.831	SD in Log Scale	5.18
95% t UCL (assumes normality of ROS data)	3.077	95% Percentile Bootstrap UCL	3.428
95% BCA Bootstrap UCL	5.694	95% Bootstrap t UCL	363.8
95% H-UCL (Log ROS)	1751		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.56	KM Geo Mean	0.00385
KM SD (logged)	1.926	95% Critical H Value (KM-Log)	3.606
KM Standard Error of Mean (logged)	0.4	95% H-UCL (KM -Log)	0.0795
KM SD (logged)	1.926	95% Critical H Value (KM-Log)	3.606
KM Standard Error of Mean (logged)	0.4		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.217	Mean in Log Scale	-3.659
SD in Original Scale	6.823	SD in Log Scale	2.048
95% t UCL (Assumes normality)	3.138	95% H-Stat UCL	0.778

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	3.48

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Heptachlor (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	2	Number of Non-Detects	34
Number of Distinct Detects	2	Number of Distinct Non-Detects	22
Minimum Detect	0.17	Minimum Non-Detect	0.0021
Maximum Detect	0.37	Maximum Non-Detect	2.1
Variance Detects	0.02	Percent Non-Detects	94.44%
Mean Detects	0.27	SD Detects	0.141
Median Detects	0.27	CV Detects	0.524
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.383	SD of Logged Detects	0.55

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

KM Mean	0.0182	KM Standard Error of Mean	0.0164
KM SD	0.0675	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0459	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0452	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0674	95% KM Chebyshev UCL	0.0897
97.5% KM Chebyshev UCL	0.121	99% KM Chebyshev UCL	0.181

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	6.94	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0389	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	27.76	nu star (bias corrected)	N/A
Mean (detects)	0.27		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0182	SD (KM)	0.0675
Variance (KM)	0.00455	SE of Mean (KM)	0.0164
k hat (KM)	0.0731	k star (KM)	0.0855
nu hat (KM)	5.261	nu star (KM)	6.156
theta hat (KM)	0.25	theta star (KM)	0.213
80% gamma percentile (KM)	0.00983	90% gamma percentile (KM)	0.045
95% gamma percentile (KM)	0.106	99% gamma percentile (KM)	0.313

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0428
Approximate Chi Square Value (6.16, α)	1.72	Adjusted Chi Square Value (6.16, β)	1.616
95% Gamma Approximate KM-UCL (use when n>=50)	0.0653	95% Gamma Adjusted KM-UCL (use when n<50)	0.0695

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0269	Mean in Log Scale	-4.36
SD in Original Scale	0.0648	SD in Log Scale	0.935
95% t UCL (assumes normality of ROS data)	0.0452	95% Percentile Bootstrap UCL	0.0471
95% BCA Bootstrap UCL	0.0572	95% Bootstrap t UCL	0.164
95% H-UCL (Log ROS)	0.0285		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.871	KM Geo Mean	0.00282
KM SD (logged)	1.151	95% Critical H Value (KM-Log)	2.559
KM Standard Error of Mean (logged)	0.286	95% H-UCL (KM -Log)	0.00899
KM SD (logged)	1.151	95% Critical H Value (KM-Log)	2.559
KM Standard Error of Mean (logged)	0.286		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0685	Mean in Log Scale	-4.374
SD in Original Scale	0.183	SD in Log Scale	1.778
95% t UCL (Assumes normality)	0.12	95% H-Stat UCL	0.17

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 (Chebyshev) UCL	0.0897

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.

Lead (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	34
		Number of Missing Observations	0
Minimum	59.1	Mean	4055
Maximum	45100	Median	1620
SD	7808	Std. Error of Mean	1301
Coefficient of Variation	1.926	Skewness	4.458

Normal GOF Test

Shapiro Wilk Test Statistic	0.492	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.304	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	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	6253	95% Adjusted-CLT UCL (Chen-1995)	7228
		95% Modified-t UCL (Johnson-1978)	6415

Gamma GOF Test

A-D Test Statistic	0.699	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.802	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.174	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.154	Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.609	k star (bias corrected MLE)	0.576
Theta hat (MLE)	6664	Theta star (bias corrected MLE)	7036
nu hat (MLE)	43.81	nu star (bias corrected)	41.49
MLE Mean (bias corrected)	4055	MLE Sd (bias corrected)	5341
		Approximate Chi Square Value (0.05)	27.73
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	27.22

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	6067	95% Adjusted Gamma UCL (use when n<50)	6182

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.979	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.111	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.079	Mean of logged Data	7.294
Maximum of Logged Data	10.72	SD of logged Data	1.53

Assuming Lognormal Distribution

95% H-UCL	10444	90% Chebyshev (MVUE) UCL	8854
95% Chebyshev (MVUE) UCL	10849	97.5% Chebyshev (MVUE) UCL	13620
99% Chebyshev (MVUE) UCL	19061		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6195	95% Jackknife UCL	6253
95% Standard Bootstrap UCL	6161	95% Bootstrap-t UCL	9388
95% Hall's Bootstrap UCL	14682	95% Percentile Bootstrap UCL	6535
95% BCA Bootstrap UCL	7733		
90% Chebyshev(Mean, Sd) UCL	7959	95% Chebyshev(Mean, Sd) UCL	9727
97.5% Chebyshev(Mean, Sd) UCL	12181	99% Chebyshev(Mean, Sd) UCL	17003

Suggested UCL to Use

95% Adjusted Gamma UCL 6182

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Lead (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	36
		Number of Missing Observations	0
Minimum	14.9	Mean	531.1
Maximum	3600	Median	175
SD	796.1	Std. Error of Mean	132.7
Coefficient of Variation	1.499	Skewness	2.5

Normal GOF Test

Shapiro Wilk Test Statistic	0.666	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	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	755.3	95% Adjusted-CLT UCL (Chen-1995)	808.5
		95% Modified-t UCL (Johnson-1978)	764.5

Gamma GOF Test

A-D Test Statistic	1.234	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.799	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.155	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.154	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.636	k star (bias corrected MLE)	0.602
Theta hat (MLE)	834.6	Theta star (bias corrected MLE)	882.4
nu hat (MLE)	45.82	nu star (bias corrected)	43.34
MLE Mean (bias corrected)	531.1	MLE Sd (bias corrected)	684.6
		Approximate Chi Square Value (0.05)	29.24
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	28.71

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	787.2	95% Adjusted Gamma UCL (use when n<50)	801.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.105	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.701	Mean of logged Data	5.312
Maximum of Logged Data	8.189	SD of logged Data	1.449

Assuming Lognormal Distribution

95% H-UCL	1192	90% Chebyshev (MVUE) UCL	1056
95% Chebyshev (MVUE) UCL	1285	97.5% Chebyshev (MVUE) UCL	1604
99% Chebyshev (MVUE) UCL	2230		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	749.4	95% Jackknife UCL	755.3
95% Standard Bootstrap UCL	743.4	95% Bootstrap-t UCL	860.1
95% Hall's Bootstrap UCL	992.2	95% Percentile Bootstrap UCL	752.7
95% BCA Bootstrap UCL	812.6		
90% Chebyshev(Mean, Sd) UCL	929.2	95% Chebyshev(Mean, Sd) UCL	1109
97.5% Chebyshev(Mean, Sd) UCL	1360	99% Chebyshev(Mean, Sd) UCL	1851

Suggested UCL to Use

95% H-UCL 1192

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Lead (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	22.6	Mean	1119
Maximum	13400	Median	400
SD	2340	Std. Error of Mean	390
Coefficient of Variation	2.091	Skewness	4.523

Normal GOF Test

Shapiro Wilk Test Statistic	0.456	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.322	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	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	1778	95% Adjusted-CLT UCL (Chen-1995)	2074
		95% Modified-t UCL (Johnson-1978)	1827

Gamma GOF Test

A-D Test Statistic	1.347	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.801	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.155	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.154	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.618	k star (bias corrected MLE)	0.585
Theta hat (MLE)	1809	Theta star (bias corrected MLE)	1911
nu hat (MLE)	44.52	nu star (bias corrected)	42.15
MLE Mean (bias corrected)	1119	MLE Sd (bias corrected)	1462
		Approximate Chi Square Value (0.05)	28.26
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	27.75

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1668	95% Adjusted Gamma UCL (use when n<50)	1700

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.982	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.103	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.118	Mean of logged Data	6.025
Maximum of Logged Data	9.503	SD of logged Data	1.386

Assuming Lognormal Distribution

95% H-UCL	2112	90% Chebyshev (MVUE) UCL	1930
95% Chebyshev (MVUE) UCL	2337	97.5% Chebyshev (MVUE) UCL	2902
99% Chebyshev (MVUE) UCL	4013		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1760	95% Jackknife UCL	1778
95% Standard Bootstrap UCL	1756	95% Bootstrap-t UCL	2894
95% Hall's Bootstrap UCL	4371	95% Percentile Bootstrap UCL	1834
95% BCA Bootstrap UCL	2226		
90% Chebyshev(Mean, Sd) UCL	2289	95% Chebyshev(Mean, Sd) UCL	2819
97.5% Chebyshev(Mean, Sd) UCL	3554	99% Chebyshev(Mean, Sd) UCL	4999

Suggested UCL to Use

95% H-UCL	2112

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Lead (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	36
		Number of Missing Observations	0
Minimum	33.7	Mean	4745
Maximum	78400	Median	284
SD	16680	Std. Error of Mean	2780
Coefficient of Variation	3.516	Skewness	4.057

Normal GOF Test

Shapiro Wilk Test Statistic	0.305	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.451	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	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	9442	95% Adjusted-CLT UCL (Chen-1995)	11326
		95% Modified-t UCL (Johnson-1978)	9755

Gamma GOF Test

A-D Test Statistic	5.307	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.866	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.298	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.16	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.281	k star (bias corrected MLE)	0.276
Theta hat (MLE)	16883	Theta star (bias corrected MLE)	17182
nu hat (MLE)	20.23	nu star (bias corrected)	19.88
MLE Mean (bias corrected)	4745	MLE Sd (bias corrected)	9029
		Approximate Chi Square Value (0.05)	10.76
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	10.46

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	8764	95% Adjusted Gamma UCL (use when n<50)	9019

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.89	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.161	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.517	Mean of logged Data	5.985
Maximum of Logged Data	11.27	SD of logged Data	1.831

Assuming Lognormal Distribution

95% H-UCL	6225	90% Chebyshev (MVUE) UCL	4268
95% Chebyshev (MVUE) UCL	5339	97.5% Chebyshev (MVUE) UCL	6827
99% Chebyshev (MVUE) UCL	9749		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	9317	95% Jackknife UCL	9442
95% Standard Bootstrap UCL	9298	95% Bootstrap-t UCL	53749
95% Hall's Bootstrap UCL	51067	95% Percentile Bootstrap UCL	9493
95% BCA Bootstrap UCL	11553		
90% Chebyshev(Mean, Sd) UCL	13084	95% Chebyshev(Mean, Sd) UCL	16862
97.5% Chebyshev(Mean, Sd) UCL	22106	99% Chebyshev(Mean, Sd) UCL	32405

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 16862

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.

Methoxychlor (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	18
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	18

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (1) was not processed!

Methoxychlor (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	24

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (2) was not processed!

Methoxychlor (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	25
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	25

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (3) was not processed!

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Methoxychlor (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	23

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (4) was not processed!

Toxaphene (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	8	Number of Non-Detects	28
Number of Distinct Detects	8	Number of Distinct Non-Detects	18
Minimum Detect	2.2	Minimum Non-Detect	1.2
Maximum Detect	21	Maximum Non-Detect	43
Variance Detects	41.87	Percent Non-Detects	77.78%
Mean Detects	9.413	SD Detects	6.47
Median Detects	8.55	CV Detects	0.687
Skewness Detects	0.973	Kurtosis Detects	0.0264
Mean of Logged Detects	2.021	SD of Logged Detects	0.737

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.282	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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

KM Mean	3.803	KM Standard Error of Mean	0.942
KM SD	4.647	95% KM (BCA) UCL	5.846
95% KM (t) UCL	5.394	95% KM (Percentile Bootstrap) UCL	5.489
95% KM (z) UCL	5.352	95% KM Bootstrap t UCL	5.425
90% KM Chebyshev UCL	6.629	95% KM Chebyshev UCL	7.909
97.5% KM Chebyshev UCL	9.685	99% KM Chebyshev UCL	13.17

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.281	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.198	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.297	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)	2.42	k star (bias corrected MLE)	1.596
Theta hat (MLE)	3.89	Theta star (bias corrected MLE)	5.899
nu hat (MLE)	38.71	nu star (bias corrected)	25.53
Mean (detects)	9.413		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.469
Maximum	21	Median	0.01
SD	4.915	CV	1.991
k hat (MLE)	0.212	k star (bias corrected MLE)	0.213
Theta hat (MLE)	11.63	Theta star (bias corrected MLE)	11.59
nu hat (MLE)	15.28	nu star (bias corrected)	15.34
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (15.34, α)	7.499	Adjusted Chi Square Value (15.34, β)	7.25
95% Gamma Approximate UCL (use when n>=50)	5.05	95% Gamma Adjusted UCL (use when n<50)	5.224

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.803	SD (KM)	4.647
Variance (KM)	21.6	SE of Mean (KM)	0.942
k hat (KM)	0.67	k star (KM)	0.632
nu hat (KM)	48.22	nu star (KM)	45.53
theta hat (KM)	5.679	theta star (KM)	6.013
80% gamma percentile (KM)	6.266	90% gamma percentile (KM)	9.774
95% gamma percentile (KM)	13.43	99% gamma percentile (KM)	22.22

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (45.53, α)	31.05	Adjusted Chi Square Value (45.53, β)	30.51
95% Gamma Approximate KM-UCL (use when n>=50)	5.576	95% Gamma Adjusted KM-UCL (use when n<50)	5.676

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.183	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	3.43	Mean in Log Scale	0.766
SD in Original Scale	4.445	SD in Log Scale	0.879
95% t UCL (assumes normality of ROS data)	4.681	95% Percentile Bootstrap UCL	4.635
95% BCA Bootstrap UCL	5.011	95% Bootstrap t UCL	5.421
95% H-UCL (Log ROS)	4.418		

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.841	KM Geo Mean	2.318
KM SD (logged)	0.902	95% Critical H Value (KM-Log)	2.276
KM Standard Error of Mean (logged)	0.206	95% H-UCL (KM -Log)	4.929
KM SD (logged)	0.902	95% Critical H Value (KM-Log)	2.276
KM Standard Error of Mean (logged)	0.206		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.675	Mean in Log Scale	1.341
SD in Original Scale	5.26	SD in Log Scale	0.938
95% t UCL (Assumes normality)	7.156	95% H-Stat UCL	8.557

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 5.394

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.

Toxaphene (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	23
Number of Detects	4	Number of Non-Detects	32
Number of Distinct Detects	3	Number of Distinct Non-Detects	21
Minimum Detect	0.74	Minimum Non-Detect	1
Maximum Detect	16	Maximum Non-Detect	2100
Variance Detects	62.03	Percent Non-Detects	88.89%
Mean Detects	9.31	SD Detects	7.876
Median Detects	10.25	CV Detects	0.846
Skewness Detects	-0.194	Kurtosis Detects	-4.893
Mean of Logged Detects	1.687	SD of Logged Detects	1.454

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.302	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	2.227	KM Standard Error of Mean	1.008
KM SD	4.243	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.93	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.885	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	5.251	95% KM Chebyshev UCL	6.621
97.5% KM Chebyshev UCL	8.522	99% KM Chebyshev UCL	12.26

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.433	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.666	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.323	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.402	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)	1.054	k star (bias corrected MLE)	0.43
Theta hat (MLE)	8.829	Theta star (bias corrected MLE)	21.64
nu hat (MLE)	8.436	nu star (bias corrected)	3.442
Mean (detects)	9.31		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.607
Maximum	16	Median	0.347
SD	3.756	CV	2.338
k hat (MLE)	0.285	k star (bias corrected MLE)	0.28
Theta hat (MLE)	5.641	Theta star (bias corrected MLE)	5.746
nu hat (MLE)	20.51	nu star (bias corrected)	20.13
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (20.13, α)	10.95	Adjusted Chi Square Value (20.13, β)	10.64
95% Gamma Approximate UCL (use when n>=50)	2.954	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.227	SD (KM)	4.243
Variance (KM)	18	SE of Mean (KM)	1.008
k hat (KM)	0.275	k star (KM)	0.271
nu hat (KM)	19.83	nu star (KM)	19.52
theta hat (KM)	8.084	theta star (KM)	8.217
80% gamma percentile (KM)	3.322	90% gamma percentile (KM)	6.64
95% gamma percentile (KM)	10.52	99% gamma percentile (KM)	20.73

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.52, α)	10.49	Adjusted Chi Square Value (19.52, β)	10.19
95% Gamma Approximate KM-UCL (use when n>=50)	4.141	95% Gamma Adjusted KM-UCL (use when n<50)	4.264

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.852	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.272	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	1.864	Mean in Log Scale	-0.0194
SD in Original Scale	3.569	SD in Log Scale	0.928
95% t UCL (assumes normality of ROS data)	2.869	95% Percentile Bootstrap UCL	2.978
95% BCA Bootstrap UCL	3.524	95% Bootstrap t UCL	5.902
95% H-UCL (Log ROS)	2.166		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0585	KM Geo Mean	1.06
KM SD (logged)	0.919	95% Critical H Value (KM-Log)	2.293
KM Standard Error of Mean (logged)	0.225	95% H-UCL (KM -Log)	2.31
KM SD (logged)	0.919	95% Critical H Value (KM-Log)	2.293
KM Standard Error of Mean (logged)	0.225		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	42.67	Mean in Log Scale	1.654
SD in Original Scale	176.2	SD in Log Scale	1.595
95% t UCL (Assumes normality)	92.3	95% H-Stat UCL	43.45

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	3.93

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.

Toxaphene (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	25
Number of Detects	3	Number of Non-Detects	33
Number of Distinct Detects	3	Number of Distinct Non-Detects	22
Minimum Detect	0.25	Minimum Non-Detect	0.24
Maximum Detect	1.4	Maximum Non-Detect	490
Variance Detects	0.368	Percent Non-Detects	91.67%
Mean Detects	0.713	SD Detects	0.607
Median Detects	0.49	CV Detects	0.85
Skewness Detects	1.432	Kurtosis Detects	N/A
Mean of Logged Detects	-0.588	SD of Logged Detects	0.868

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	0.898	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.31	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.452	KM Standard Error of Mean	0.185
KM SD	0.398	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.765	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.756	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.007	95% KM Chebyshev UCL	1.258
97.5% KM Chebyshev UCL	1.607	99% KM Chebyshev UCL	2.293

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.153	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.331	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	12.92	nu star (bias corrected)	N/A
Mean (detects)	0.713		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.218
Maximum	1.4	Median	0.134
SD	0.282	CV	1.298
k hat (MLE)	0.726	k star (bias corrected MLE)	0.684
Theta hat (MLE)	0.3	Theta star (bias corrected MLE)	0.318
nu hat (MLE)	52.31	nu star (bias corrected)	49.28
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (49.28, α)	34.16	Adjusted Chi Square Value (49.28, β)	33.59
95% Gamma Approximate UCL (use when n>=50)	0.314	95% Gamma Adjusted UCL (use when n<50)	N/A

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.452	SD (KM)	0.398
Variance (KM)	0.158	SE of Mean (KM)	0.185
k hat (KM)	1.293	k star (KM)	1.204
nu hat (KM)	93.08	nu star (KM)	86.66
theta hat (KM)	0.35	theta star (KM)	0.376
80% gamma percentile (KM)	0.715	90% gamma percentile (KM)	0.994
95% gamma percentile (KM)	1.269	99% gamma percentile (KM)	1.899

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (86.66, α)	66.2	Adjusted Chi Square Value (86.66, β)	65.39
95% Gamma Approximate KM-UCL (use when n>=50)	0.592	95% Gamma Adjusted KM-UCL (use when n<50)	0.599

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.984	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.224	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.279	Mean in Log Scale	-1.481
SD in Original Scale	0.235	SD in Log Scale	0.61
95% t UCL (assumes normality of ROS data)	0.345	95% Percentile Bootstrap UCL	0.345
95% BCA Bootstrap UCL	0.379	95% Bootstrap t UCL	0.394
95% H-UCL (Log ROS)	0.336		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.039	KM Geo Mean	0.354
KM SD (logged)	0.618	95% Critical H Value (KM-Log)	2.003
KM Standard Error of Mean (logged)	0.291	95% H-UCL (KM -Log)	0.528
KM SD (logged)	0.618	95% Critical H Value (KM-Log)	2.003
KM Standard Error of Mean (logged)	0.291		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	22.15	Mean in Log Scale	1.214
SD in Original Scale	48.77	SD in Log Scale	2.014
95% t UCL (Assumes normality)	35.89	95% H-Stat UCL	91.3

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	0.765

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.

Toxaphene (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	24
Number of Detects	0	Number of Non-Detects	36
Number of Distinct Detects	0	Number of Distinct Non-Detects	24

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (4) was not processed!

Zinc (1)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	90	Mean	836.5
Maximum	4730	Median	491.5
SD	966.8	Std. Error of Mean	161.1
Coefficient of Variation	1.156	Skewness	2.598

Normal GOF Test

Shapiro Wilk Test Statistic	0.68	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.282	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	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	1109	95% Adjusted-CLT UCL (Chen-1995)	1176
		95% Modified-t UCL (Johnson-1978)	1120

Gamma GOF Test

A-D Test Statistic	1.083	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.772	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.159	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.15	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma Statistics

k hat (MLE)	1.231	k star (bias corrected MLE)	1.147
Theta hat (MLE)	679.6	Theta star (bias corrected MLE)	729.4
nu hat (MLE)	88.63	nu star (bias corrected)	82.57
MLE Mean (bias corrected)	836.5	MLE Sd (bias corrected)	781.1
		Approximate Chi Square Value (0.05)	62.63
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	61.84

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1103	95% Adjusted Gamma UCL (use when n<50)	1117

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.153	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.5	Mean of logged Data	6.271
Maximum of Logged Data	8.462	SD of logged Data	0.959

Assuming Lognormal Distribution

95% H-UCL	1224	90% Chebyshev (MVUE) UCL	1276
95% Chebyshev (MVUE) UCL	1482	97.5% Chebyshev (MVUE) UCL	1767
99% Chebyshev (MVUE) UCL	2327		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1102	95% Jackknife UCL	1109
95% Standard Bootstrap UCL	1097	95% Bootstrap-t UCL	1275
95% Hall's Bootstrap UCL	1274	95% Percentile Bootstrap UCL	1123
95% BCA Bootstrap UCL	1180		
90% Chebyshev(Mean, Sd) UCL	1320	95% Chebyshev(Mean, Sd) UCL	1539
97.5% Chebyshev(Mean, Sd) UCL	1843	99% Chebyshev(Mean, Sd) UCL	2440

Suggested UCL to Use

95% H-UCL	1224

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Zinc (2)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	32.7	Mean	511.7
Maximum	4620	Median	212
SD	840.2	Std. Error of Mean	140
Coefficient of Variation	1.642	Skewness	3.727

Normal GOF Test

Shapiro Wilk Test Statistic	0.566	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.284	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	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	748.2	95% Adjusted-CLT UCL (Chen-1995)	834.9
		95% Modified-t UCL (Johnson-1978)	762.7

Gamma GOF Test

A-D Test Statistic	1.385	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.786	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.182	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.152	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.783	k star (bias corrected MLE)	0.736
Theta hat (MLE)	653.6	Theta star (bias corrected MLE)	695.1
nu hat (MLE)	56.36	nu star (bias corrected)	53
MLE Mean (bias corrected)	511.7	MLE Sd (bias corrected)	596.4
		Approximate Chi Square Value (0.05)	37.27
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	36.67

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	727.5	95% Adjusted Gamma UCL (use when n<50)	739.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.116	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Lognormal Statistics

Minimum of Logged Data	3.487	Mean of logged Data	5.477
Maximum of Logged Data	8.438	SD of logged Data	1.194

Assuming Lognormal Distribution

95% H-UCL	826.2	90% Chebyshev (MVUE) UCL	813.6
95% Chebyshev (MVUE) UCL	968.1	97.5% Chebyshev (MVUE) UCL	1183
99% Chebyshev (MVUE) UCL	1604		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	742	95% Jackknife UCL	748.2
95% Standard Bootstrap UCL	735.8	95% Bootstrap-t UCL	976.1
95% Hall's Bootstrap UCL	1711	95% Percentile Bootstrap UCL	762.7
95% BCA Bootstrap UCL	858.9		
90% Chebyshev(Mean, Sd) UCL	931.8	95% Chebyshev(Mean, Sd) UCL	1122
97.5% Chebyshev(Mean, Sd) UCL	1386	99% Chebyshev(Mean, Sd) UCL	1905

Suggested UCL to Use

95% H-UCL 826.2

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Zinc (3)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	36
Number of Detects	34	Number of Non-Detects	2
Number of Distinct Detects	34	Number of Distinct Non-Detects	2
Minimum Detect	93.9	Minimum Non-Detect	96.5
Maximum Detect	1000	Maximum Non-Detect	111
Variance Detects	82686	Percent Non-Detects	5.556%
Mean Detects	494.6	SD Detects	287.6
Median Detects	483	CV Detects	0.581
Skewness Detects	0.241	Kurtosis Detects	-1.164
Mean of Logged Detects	5.99	SD of Logged Detects	0.72

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.111	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	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

KM Mean	472.5	KM Standard Error of Mean	49.07
KM SD	290.1	95% KM (BCA) UCL	556.7
95% KM (t) UCL	555.4	95% KM (Percentile Bootstrap) UCL	552.8
95% KM (z) UCL	553.2	95% KM Bootstrap t UCL	557.2
90% KM Chebyshev UCL	619.7	95% KM Chebyshev UCL	686.4
97.5% KM Chebyshev UCL	778.9	99% KM Chebyshev UCL	960.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.672	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.109	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.152	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)	2.488	k star (bias corrected MLE)	2.288
Theta hat (MLE)	198.8	Theta star (bias corrected MLE)	216.2
nu hat (MLE)	169.2	nu star (bias corrected)	155.6
Mean (detects)	494.6		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	83.32	Mean	472.4
Maximum	1000	Median	453
SD	294.3	CV	0.623
k hat (MLE)	2.16	k star (bias corrected MLE)	1.999
Theta hat (MLE)	218.7	Theta star (bias corrected MLE)	236.3
nu hat (MLE)	155.5	nu star (bias corrected)	143.9
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (143.90, α)	117.2	Adjusted Chi Square Value (143.90, β)	116.1
95% Gamma Approximate UCL (use when n>=50)	580.1	95% Gamma Adjusted UCL (use when n<50)	585.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	472.5	SD (KM)	290.1
Variance (KM)	84139	SE of Mean (KM)	49.07
k hat (KM)	2.653	k star (KM)	2.451
nu hat (KM)	191	nu star (KM)	176.5
theta hat (KM)	178.1	theta star (KM)	192.8
80% gamma percentile (KM)	690.5	90% gamma percentile (KM)	876.8
95% gamma percentile (KM)	1052	99% gamma percentile (KM)	1437

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (176.45, α)	146.7	Adjusted Chi Square Value (176.45, β)	145.5
95% Gamma Approximate KM-UCL (use when n>=50)	568.2	95% Gamma Adjusted KM-UCL (use when n<50)	573

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.909	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.129	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	Detected Data appear 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	472.5	Mean in Log Scale	5.911
SD in Original Scale	294.1	SD in Log Scale	0.773
95% t UCL (assumes normality of ROS data)	555.4	95% Percentile Bootstrap UCL	549.2
95% BCA Bootstrap UCL	549.1	95% Bootstrap t UCL	555
95% H-UCL (Log ROS)	658.7		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.91	KM Geo Mean	368.8
KM SD (logged)	0.763	95% Critical H Value (KM-Log)	2.135
KM Standard Error of Mean (logged)	0.129	95% H-UCL (KM -Log)	649.9
KM SD (logged)	0.763	95% Critical H Value (KM-Log)	2.135
KM Standard Error of Mean (logged)	0.129		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	470	Mean in Log Scale	5.876
SD in Original Scale	297.6	SD in Log Scale	0.845
95% t UCL (Assumes normality)	553.8	95% H-Stat UCL	699.3

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 555.4

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Zinc (4)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	33.9	Mean	339.3
Maximum	1490	Median	190.5
SD	345.1	Std. Error of Mean	57.52
Coefficient of Variation	1.017	Skewness	1.946

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	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	436.5	95% Adjusted-CLT UCL (Chen-1995)	453.9
		95% Modified-t UCL (Johnson-1978)	439.6

Gamma GOF Test

A-D Test Statistic	1.099	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.769	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.194	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.15	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.374	k star (bias corrected MLE)	1.278
Theta hat (MLE)	247	Theta star (bias corrected MLE)	265.6
nu hat (MLE)	98.9	nu star (bias corrected)	91.99
MLE Mean (bias corrected)	339.3	MLE Sd (bias corrected)	300.2
		Approximate Chi Square Value (0.05)	70.87
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	70.03

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	440.4	95% Adjusted Gamma UCL (use when n<50)	445.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.131	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.523	Mean of logged Data	5.421
Maximum of Logged Data	7.307	SD of logged Data	0.904

Prepared by: IMR 6/11/18
Checked by: LO 6/12/18

Assuming Lognormal Distribution

95% H-UCL	482	90% Chebyshev (MVUE) UCL	507.1
95% Chebyshev (MVUE) UCL	585	97.5% Chebyshev (MVUE) UCL	693.2
99% Chebyshev (MVUE) UCL	905.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	433.9	95% Jackknife UCL	436.5
95% Standard Bootstrap UCL	435.2	95% Bootstrap-t UCL	463.7
95% Hall's Bootstrap UCL	479.6	95% Percentile Bootstrap UCL	441.4
95% BCA Bootstrap UCL	457.1		
90% Chebyshev(Mean, Sd) UCL	511.9	95% Chebyshev(Mean, Sd) UCL	590
97.5% Chebyshev(Mean, Sd) UCL	698.5	99% Chebyshev(Mean, Sd) UCL	911.6

Suggested UCL to Use

95% H-UCL 482

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

ATTACHMENT B

UCL Statistics for Data Sets with Non-Detects
Post-Corrective Action UCLs by Areas 1-4

User Selected Options	
Date/Time of Computation	ProUCL 5.16/22/2018 12:49:16 PM
From File	COC List UCL Input For Mapping_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDT (1)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.35	Mean	3.141
Maximum	8.6	Median	2.5
SD	2.683	Std. Error of Mean	0.948
Coefficient of Variation	0.854	Skewness	1.265

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.899	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.205	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	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	4.938	95% Adjusted-CLT UCL (Chen-1995)	5.155
		95% Modified-t UCL (Johnson-1978)	5.009

Gamma GOF Test

A-D Test Statistic	0.142	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.116	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.299	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.44	k star (bias corrected MLE)	0.983
Theta hat (MLE)	2.182	Theta star (bias corrected MLE)	3.195
nu hat (MLE)	23.03	nu star (bias corrected)	15.73
MLE Mean (bias corrected)	3.141	MLE Sd (bias corrected)	3.168
		Approximate Chi Square Value (0.05)	7.771
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	6.409

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	6.358	95% Adjusted Gamma UCL (use when n<50)	7.709

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.17	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	-1.05	Mean of logged Data	0.759
Maximum of Logged Data	2.152	SD of logged Data	1.034

Assuming Lognormal Distribution

95% H-UCL	14.37	90% Chebyshev (MVUE) UCL	7.071
95% Chebyshev (MVUE) UCL	8.763	97.5% Chebyshev (MVUE) UCL	11.11
99% Chebyshev (MVUE) UCL	15.72		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4.701	95% Jackknife UCL	4.938
95% Standard Bootstrap UCL	4.606	95% Bootstrap-t UCL	5.785
95% Hall's Bootstrap UCL	10.58	95% Percentile Bootstrap UCL	4.788
95% BCA Bootstrap UCL	4.963		
90% Chebyshev(Mean, Sd) UCL	5.986	95% Chebyshev(Mean, Sd) UCL	7.275
97.5% Chebyshev(Mean, Sd) UCL	9.064	99% Chebyshev(Mean, Sd) UCL	12.58

Suggested UCL to Use

95% Student's-t UCL	**4.938**

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 (2)

General Statistics

Total Number of Observations	30	Number of Distinct Observations	2700.00%
Number of Detects	29	Number of Non-Detects	1
Number of Distinct Detects	26	Number of Distinct Non-Detects	1
Minimum Detect	0.069	Minimum Non-Detect	0.048
Maximum Detect	7.9	Maximum Non-Detect	0.048
Variance Detects	4.521	Percent Non-Detects	3.33%
Mean Detects	1.947	SD Detects	2.126
Median Detects	1.3	CV Detects	1.092
Skewness Detects	1.289	Kurtosis Detects	0.988
Mean of Logged Detects	-0.131	SD of Logged Detects	1.456

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.827	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.189	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.161	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

KM Mean	1.884	KM Standard Error of Mean	0.387
KM SD	2.082	95% KM (BCA) UCL	2.544
95% KM (t) UCL	2.541	95% KM (Percentile Bootstrap) UCL	2.522
95% KM (z) UCL	2.52	95% KM Bootstrap t UCL	2.658
90% KM Chebyshev UCL	3.045	95% KM Chebyshev UCL	3.57
97.5% KM Chebyshev UCL	4.3	99% KM Chebyshev UCL	5.733

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.747	Anderson-Darling GOF Test	
5% A-D Critical Value	0.784	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.174	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.169	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.751	k star (bias corrected MLE)	0.696
Theta hat (MLE)	2.593	Theta star (bias corrected MLE)	2.796
nu hat (MLE)	43.56	nu star (bias corrected)	40.39
Mean (detects)	1.947		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.883
Maximum	7.9	Median	1.2
SD	2.119	CV	1.126
k hat (MLE)	0.667	k star (bias corrected MLE)	0.622
Theta hat (MLE)	2.823	Theta star (bias corrected MLE)	3.025
nu hat (MLE)	40.01	nu star (bias corrected)	37.35
Adjusted Level of Significance (β)	0.041		
Approximate Chi Square Value (37.35, α)	24.36	Adjusted Chi Square Value (37.35, β)	23.75
95% Gamma Approximate UCL (use when n>=50)	2.887	95% Gamma Adjusted UCL (use when n<50)	2.96

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.884	SD (KM)	2.082
Variance (KM)	4.336	SE of Mean (KM)	0.387
k hat (KM)	0.819	k star (KM)	0.759
nu hat (KM)	49.11	nu star (KM)	45.53
theta hat (KM)	2.302	theta star (KM)	2.482
80% gamma percentile (KM)	3.087	90% gamma percentile (KM)	4.639
95% gamma percentile (KM)	6.228	99% gamma percentile (KM)	9.997

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (45.53, α)	31.05	Adjusted Chi Square Value (45.53, β)	30.36
95% Gamma Approximate KM-UCL (use when n>=50)	2.762	95% Gamma Adjusted KM-UCL (use when n<50)	2.825

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.912	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.149	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.161	Detected Data appear 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	1.883	Mean in Log Scale	-0.25
SD in Original Scale	2.119	SD in Log Scale	1.574
95% t UCL (assumes normality of ROS data)	2.54	95% Percentile Bootstrap UCL	2.514
95% BCA Bootstrap UCL	2.626	95% Bootstrap t UCL	2.708
95% H-UCL (Log ROS)	7.002		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.227	KM Geo Mean	0.797
KM SD (logged)	1.501	95% Critical H Value (KM-Log)	3.166
KM Standard Error of Mean (logged)	0.279	95% H-UCL (KM -Log)	5.934
KM SD (logged)	1.501	95% Critical H Value (KM-Log)	3.166
KM Standard Error of Mean (logged)	0.279		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.883	Mean in Log Scale	-0.251
SD in Original Scale	2.119	SD in Log Scale	1.575
95% t UCL (Assumes normality)	2.54	95% H-Stat UCL	7.01

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	**2.825**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (3)

General Statistics			
Total Number of Observations	22	Number of Distinct Observations	2200.00%
Number of Detects	18	Number of Non-Detects	4
Number of Distinct Detects	18	Number of Distinct Non-Detects	4
Minimum Detect	0.012	Minimum Non-Detect	0.009
Maximum Detect	19	Maximum Non-Detect	0.22
Variance Detects	30.61	Percent Non-Detects	18.18%
Mean Detects	2.516	SD Detects	5.533
Median Detects	0.445	CV Detects	2.199
Skewness Detects	2.65	Kurtosis Detects	5.981
Mean of Logged Detects	-0.801	SD of Logged Detects	1.912

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.488	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.386	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.202	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			
KM Mean	2.064	KM Standard Error of Mean	1.087
KM SD	4.957	95% KM (BCA) UCL	4.189
95% KM (t) UCL	3.936	95% KM (Percentile Bootstrap) UCL	3.863
95% KM (z) UCL	3.853	95% KM Bootstrap t UCL	13.81
90% KM Chebyshev UCL	5.327	95% KM Chebyshev UCL	6.804
97.5% KM Chebyshev UCL	8.856	99% KM Chebyshev UCL	12.88

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.283	Anderson-Darling GOF Test	
5% A-D Critical Value	0.824	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.253	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.218	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)	0.384	k star (bias corrected MLE)	0.357
Theta hat (MLE)	6.55	Theta star (bias corrected MLE)	7.045
nu hat (MLE)	13.83	nu star (bias corrected)	12.86
Mean (detects)	2.516		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	2.061
Maximum	19	Median	0.225
SD	5.075	CV	2.463
k hat (MLE)	0.31	k star (bias corrected MLE)	0.298
Theta hat (MLE)	6.656	Theta star (bias corrected MLE)	6.922
nu hat (MLE)	13.62	nu star (bias corrected)	13.1
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (13.10, α)	5.958	Adjusted Chi Square Value (13.10, β)	5.601
95% Gamma Approximate UCL (use when n>=50)	4.53	95% Gamma Adjusted UCL (use when n<50)	4.818

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	2.064	SD (KM)	4.957
Variance (KM)	24.57	SE of Mean (KM)	1.087
k hat (KM)	0.173	k star (KM)	0.18
nu hat (KM)	7.631	nu star (KM)	7.923
theta hat (KM)	11.9	theta star (KM)	11.46
80% gamma percentile (KM)	2.562	90% gamma percentile (KM)	6.226
95% gamma percentile (KM)	10.92	99% gamma percentile (KM)	24.07

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (7.92, α)	2.691	Adjusted Chi Square Value (7.92, β)	2.468
95% Gamma Approximate KM-UCL (use when n>=50)	6.079	95% Gamma Adjusted KM-UCL (use when n<50)	6.627

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.97	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.115	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.202	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	2.062	Mean in Log Scale	-1.445
SD in Original Scale	5.074	SD in Log Scale	2.252
95% t UCL (assumes normality of ROS data)	3.924	95% Percentile Bootstrap UCL	3.923
95% BCA Bootstrap UCL	4.682	95% Bootstrap t UCL	13.67
95% H-UCL (Log ROS)	28.91		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.395	KM Geo Mean	0.248
KM SD (logged)	2.139	95% Critical H Value (KM-Log)	4.428
KM Standard Error of Mean (logged)	0.475	95% H-UCL (KM -Log)	19.29
KM SD (logged)	2.139	95% Critical H Value (KM-Log)	4.428
KM Standard Error of Mean (logged)	0.475		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.067	Mean in Log Scale	-1.318
SD in Original Scale	5.073	SD in Log Scale	2.116
95% t UCL (Assumes normality)	3.928	95% H-Stat UCL	19.03

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 (Chebyshev) UCL	**6.804**

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 (4)

General Statistics

Total Number of Observations	25	Number of Distinct Observations	2400%
Number of Detects	12	Number of Non-Detects	13
Number of Distinct Detects	12	Number of Distinct Non-Detects	12
Minimum Detect	0.012	Minimum Non-Detect	0.0041
Maximum Detect	82	Maximum Non-Detect	0.48
Variance Detects	547.2	Percent Non-Detects	52%
Mean Detects	8.23	SD Detects	23.39
Median Detects	0.175	CV Detects	2.842
Skewness Detects	3.382	Kurtosis Detects	11.57
Mean of Logged Detects	-1.144	SD of Logged Detects	2.804

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.404	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.421	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	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

KM Mean	3.956	KM Standard Error of Mean	3.353
KM SD	16.05	95% KM (BCA) UCL	10.44
95% KM (t) UCL	9.693	95% KM (Percentile Bootstrap) UCL	10.27
95% KM (z) UCL	9.471	95% KM Bootstrap t UCL	49.16
90% KM Chebyshev UCL	14.02	95% KM Chebyshev UCL	18.57
97.5% KM Chebyshev UCL	24.9	99% KM Chebyshev UCL	37.32

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.085	Anderson-Darling GOF Test	
5% A-D Critical Value	0.861	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.251	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.27	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.223	k star (bias corrected MLE)	0.222
Theta hat (MLE)	36.98	Theta star (bias corrected MLE)	37
nu hat (MLE)	5.34	nu star (bias corrected)	5.339
Mean (detects)	8.23		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.955
Maximum	82	Median	0.01
SD	16.38	CV	4.142
k hat (MLE)	0.174	k star (bias corrected MLE)	0.18
Theta hat (MLE)	22.72	Theta star (bias corrected MLE)	21.99
nu hat (MLE)	8.703	nu star (bias corrected)	8.992
Adjusted Level of Significance (β)	0.0395		
Approximate Chi Square Value (8.99, α)	3.322	Adjusted Chi Square Value (8.99, β)	3.091
95% Gamma Approximate UCL (use when n>=50)	10.71	95% Gamma Adjusted UCL (use when n<50)	11.51

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.956	SD (KM)	16.05
Variance (KM)	257.6	SE of Mean (KM)	3.353
k hat (KM)	0.0608	k star (KM)	0.0801
nu hat (KM)	3.038	nu star (KM)	4.007
theta hat (KM)	65.12	theta star (KM)	49.37
80% gamma percentile (KM)	1.889	90% gamma percentile (KM)	9.391
95% gamma percentile (KM)	23.01	99% gamma percentile (KM)	70.01

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.01, α)	0.724	Adjusted Chi Square Value (4.01, β)	0.638
95% Gamma Approximate KM-UCL (use when n>=50)	21.88	95% Gamma Adjusted KM-UCL (use when n<50)	24.83

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.93	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.156	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	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	3.951	Mean in Log Scale	-4.41
SD in Original Scale	16.38	SD in Log Scale	3.817
95% t UCL (assumes normality of ROS data)	9.557	95% Percentile Bootstrap UCL	10.38
95% BCA Bootstrap UCL	14.22	95% Bootstrap t UCL	49.86
95% H-UCL (Log ROS)	4339		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.222	KM Geo Mean	0.0399
KM SD (logged)	2.794	95% Critical H Value (KM-Log)	5.297
KM Standard Error of Mean (logged)	0.597	95% H-UCL (KM -Log)	40.45
KM SD (logged)	2.794	95% Critical H Value (KM-Log)	5.297
KM Standard Error of Mean (logged)	0.597		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3.981	Mean in Log Scale	-2.833
SD in Original Scale	16.38	SD in Log Scale	2.833
95% t UCL (Assumes normality)	9.585	95% H-Stat UCL	72.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	**24.83**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (1)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	800%
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	12.7	Minimum Non-Detect	8
Maximum Detect	51.2	Maximum Non-Detect	10.2
Variance Detects	186.3	Percent Non-Detects	25%
Mean Detects	32.57	SD Detects	13.65
Median Detects	34.5	CV Detects	0.419
Skewness Detects	-0.195	Kurtosis Detects	-0.421
Mean of Logged Detects	3.392	SD of Logged Detects	0.498

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.979	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.184	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	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

KM Mean	26.43	KM Standard Error of Mean	5.868
KM SD	15.15	95% KM (BCA) UCL	35.71
95% KM (t) UCL	37.54	95% KM (Percentile Bootstrap) UCL	35.35
95% KM (z) UCL	36.08	95% KM Bootstrap t UCL	36.49
90% KM Chebyshev UCL	44.03	95% KM Chebyshev UCL	52
97.5% KM Chebyshev UCL	63.07	99% KM Chebyshev UCL	84.81

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.265	Anderson-Darling GOF Test	
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.221	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.333	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)	5.65	k star (bias corrected MLE)	2.936
Theta hat (MLE)	5.764	Theta star (bias corrected MLE)	11.09
nu hat (MLE)	67.8	nu star (bias corrected)	35.23
Mean (detects)	32.57		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	4.908	Mean	25.65
Maximum	51.2	Median	26.45
SD	17.23	CV	0.672
k hat (MLE)	1.8	k star (bias corrected MLE)	1.208
Theta hat (MLE)	14.25	Theta star (bias corrected MLE)	21.23
nu hat (MLE)	28.8	nu star (bias corrected)	19.33
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (19.33, α)	10.36	Adjusted Chi Square Value (19.33, β)	8.75
95% Gamma Approximate UCL (use when n>=50)	47.86	95% Gamma Adjusted UCL (use when n<50)	56.68

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	26.43	SD (KM)	15.15
Variance (KM)	229.6	SE of Mean (KM)	5.868
k hat (KM)	3.042	k star (KM)	1.984
nu hat (KM)	48.67	nu star (KM)	31.75
theta hat (KM)	8.688	theta star (KM)	13.32
80% gamma percentile (KM)	39.6	90% gamma percentile (KM)	51.49
95% gamma percentile (KM)	62.83	99% gamma percentile (KM)	88.01

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (31.75, α)	19.87	Adjusted Chi Square Value (31.75, β)	17.54
95% Gamma Approximate KM-UCL (use when n>=50)	42.22	95% Gamma Adjusted KM-UCL (use when n<50)	47.84

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.926	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.209	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	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	26.68	Mean in Log Scale	3.094
SD in Original Scale	15.87	SD in Log Scale	0.695
95% t UCL (assumes normality of ROS data)	37.31	95% Percentile Bootstrap UCL	35.25
95% BCA Bootstrap UCL	36.08	95% Bootstrap t UCL	37.09
95% H-UCL (Log ROS)	57.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.064	KM Geo Mean	21.41
KM SD (logged)	0.692	95% Critical H Value (KM-Log)	2.717
KM Standard Error of Mean (logged)	0.268	95% H-UCL (KM -Log)	55.33
KM SD (logged)	0.692	95% Critical H Value (KM-Log)	2.717
KM Standard Error of Mean (logged)	0.268		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	25.56	Mean in Log Scale	2.921
SD in Original Scale	17.36	SD in Log Scale	0.971
95% t UCL (Assumes normality)	37.19	95% H-Stat UCL	101.8

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	**37.54**

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.

Arsenic (2)

General Statistics			
Total Number of Observations	30	Number of Distinct Observations	28
Number of Detects	20	Number of Non-Detects	10
Number of Distinct Detects	20	Number of Distinct Non-Detects	8
Minimum Detect	7.67	Minimum Non-Detect	7.33
Maximum Detect	122	Maximum Non-Detect	7.48
Variance Detects	837	Percent Non-Detects	33.33%
Mean Detects	34.75	SD Detects	28.93
Median Detects	24.45	CV Detects	0.833
Skewness Detects	1.59	Kurtosis Detects	3.044
Mean of Logged Detects	3.234	SD of Logged Detects	0.83

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.187	Lilliefors GOF Test
5% Lilliefors Critical Value	0.192	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			
KM Mean	25.61	KM Standard Error of Mean	4.946
KM SD	26.41	95% KM (BCA) UCL	33.83
95% KM (t) UCL	34.02	95% KM (Percentile Bootstrap) UCL	34.08
95% KM (z) UCL	33.75	95% KM Bootstrap t UCL	36.62
90% KM Chebyshev UCL	40.45	95% KM Chebyshev UCL	47.17
97.5% KM Chebyshev UCL	56.5	99% KM Chebyshev UCL	74.82

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.415	Anderson-Darling GOF Test
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.13	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.197	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)	1.738	k star (bias corrected MLE)	1.511
Theta hat (MLE)	19.99	Theta star (bias corrected MLE)	23
nu hat (MLE)	69.53	nu star (bias corrected)	60.43
Mean (detects)	34.75		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	23.17
Maximum	122	Median	11.45
SD	28.74	CV	1.24
k hat (MLE)	0.277	k star (bias corrected MLE)	0.272
Theta hat (MLE)	83.66	Theta star (bias corrected MLE)	85.34
nu hat (MLE)	16.62	nu star (bias corrected)	16.29
Adjusted Level of Significance (β)	0.041		
Approximate Chi Square Value (16.29, α)	8.168	Adjusted Chi Square Value (16.29, β)	7.836
95% Gamma Approximate UCL (use when n>=50)	46.22	95% Gamma Adjusted UCL (use when n<50)	48.17

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	25.61	SD (KM)	26.41
Variance (KM)	697.2	SE of Mean (KM)	4.946
k hat (KM)	0.941	k star (KM)	0.869
nu hat (KM)	56.45	nu star (KM)	52.14
theta hat (KM)	27.22	theta star (KM)	29.47
80% gamma percentile (KM)	41.65	90% gamma percentile (KM)	61.04
95% gamma percentile (KM)	80.66	99% gamma percentile (KM)	126.7

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (52.14, α)	36.55	Adjusted Chi Square Value (52.14, β)	35.8
95% Gamma Approximate KM-UCL (use when n>=50)	36.53	95% Gamma Adjusted KM-UCL (use when n<50)	37.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.127	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	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	24.38	Mean in Log Scale	2.581
SD in Original Scale	27.77	SD in Log Scale	1.16
95% t UCL (assumes normality of ROS data)	33	95% Percentile Bootstrap UCL	32.91
95% BCA Bootstrap UCL	34.18	95% Bootstrap t UCL	35.77
95% H-UCL (Log ROS)	46.16		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.82	KM Geo Mean	16.77
KM SD (logged)	0.883	95% Critical H Value (KM-Log)	2.334
KM Standard Error of Mean (logged)	0.165	95% H-UCL (KM -Log)	36.31
KM SD (logged)	0.883	95% Critical H Value (KM-Log)	2.334
KM Standard Error of Mean (logged)	0.165		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	24.41	Mean in Log Scale	2.593
SD in Original Scale	27.75	SD in Log Scale	1.14
95% t UCL (Assumes normality)	33.01	95% H-Stat UCL	44.99

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	**34.02**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (3)

General Statistics

Total Number of Observations	22	Number of Distinct Observations	21
Number of Detects	14	Number of Non-Detects	8
Number of Distinct Detects	14	Number of Distinct Non-Detects	7
Minimum Detect	11.2	Minimum Non-Detect	7.4
Maximum Detect	90.5	Maximum Non-Detect	11.1
Variance Detects	713	Percent Non-Detects	36.36%
Mean Detects	32.46	SD Detects	26.7
Median Detects	18.6	CV Detects	0.823
Skewness Detects	1.296	Kurtosis Detects	0.434
Mean of Logged Detects	3.208	SD of Logged Detects	0.737

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.784	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.274	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	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

KM Mean	23.35	KM Standard Error of Mean	5.267
KM SD	23.81	95% KM (BCA) UCL	32.94
95% KM (t) UCL	32.41	95% KM (Percentile Bootstrap) UCL	31.84
95% KM (z) UCL	32.01	95% KM Bootstrap t UCL	36.71
90% KM Chebyshev UCL	39.15	95% KM Chebyshev UCL	46.31
97.5% KM Chebyshev UCL	56.24	99% KM Chebyshev UCL	75.75

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.867	Anderson-Darling GOF Test	
5% A-D Critical Value	0.746	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.248	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.232	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)	1.987	k star (bias corrected MLE)	1.609
Theta hat (MLE)	16.34	Theta star (bias corrected MLE)	20.18
nu hat (MLE)	55.63	nu star (bias corrected)	45.04
Mean (detects)	32.46		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	20.66
Maximum	90.5	Median	12.9
SD	26.4	CV	1.277
k hat (MLE)	0.264	k star (bias corrected MLE)	0.259
Theta hat (MLE)	78.13	Theta star (bias corrected MLE)	79.87
nu hat (MLE)	11.64	nu star (bias corrected)	11.38
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (11.38, α)	4.823	Adjusted Chi Square Value (11.38, β)	4.507
95% Gamma Approximate UCL (use when n>=50)	48.76	95% Gamma Adjusted UCL (use when n<50)	52.18

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	23.35	SD (KM)	23.81
Variance (KM)	566.7	SE of Mean (KM)	5.267
k hat (KM)	0.962	k star (KM)	0.861
nu hat (KM)	42.33	nu star (KM)	37.89
theta hat (KM)	24.27	theta star (KM)	27.11
80% gamma percentile (KM)	37.99	90% gamma percentile (KM)	55.77
95% gamma percentile (KM)	73.77	99% gamma percentile (KM)	116

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (37.89, α)	24.8	Adjusted Chi Square Value (37.89, β)	24.01
95% Gamma Approximate KM-UCL (use when n>=50)	35.68	95% Gamma Adjusted KM-UCL (use when n<50)	36.86

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.882	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.216	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	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	22.14	Mean in Log Scale	2.548
SD in Original Scale	25.24	SD in Log Scale	1.069
95% t UCL (assumes normality of ROS data)	31.4	95% Percentile Bootstrap UCL	30.52
95% BCA Bootstrap UCL	33.5	95% Bootstrap t UCL	34.94
95% H-UCL (Log ROS)	42.27		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.769	KM Geo Mean	15.95
KM SD (logged)	0.811	95% Critical H Value (KM-Log)	2.335
KM Standard Error of Mean (logged)	0.179	95% H-UCL (KM -Log)	33.5
KM SD (logged)	0.811	95% Critical H Value (KM-Log)	2.335
KM Standard Error of Mean (logged)	0.179		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	22.2	Mean in Log Scale	2.562
SD in Original Scale	25.19	SD in Log Scale	1.054
95% t UCL (Assumes normality)	31.44	95% H-Stat UCL	41.65

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

KM H-UCL	**33.5**

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.

Arsenic (4)

General Statistics

Total Number of Observations	25	Number of Distinct Observations	25
Number of Detects	16	Number of Non-Detects	9
Number of Distinct Detects	16	Number of Distinct Non-Detects	9
Minimum Detect	8.02	Minimum Non-Detect	7.14
Maximum Detect	170	Maximum Non-Detect	11.6
Variance Detects	1683	Percent Non-Detects	36%
Mean Detects	32.83	SD Detects	41.02
Median Detects	18.8	CV Detects	1.249
Skewness Detects	2.842	Kurtosis Detects	8.914
Mean of Logged Detects	3.058	SD of Logged Detects	0.871

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.611	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.359	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	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

KM Mean	23.61	KM Standard Error of Mean	7.039
KM SD	34.07	95% KM (BCA) UCL	37.16
95% KM (t) UCL	35.65	95% KM (Percentile Bootstrap) UCL	35.19
95% KM (z) UCL	35.18	95% KM Bootstrap t UCL	51.26
90% KM Chebyshev UCL	44.72	95% KM Chebyshev UCL	54.29
97.5% KM Chebyshev UCL	67.56	99% KM Chebyshev UCL	93.64

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.083	Anderson-Darling GOF Test	
5% A-D Critical Value	0.758	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.264	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.22	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)	1.295	k star (bias corrected MLE)	1.094
Theta hat (MLE)	25.35	Theta star (bias corrected MLE)	30.01
nu hat (MLE)	41.45	nu star (bias corrected)	35.01
Mean (detects)	32.83		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	21.02
Maximum	170	Median	11.4
SD	36.2	CV	1.722
k hat (MLE)	0.257	k star (bias corrected MLE)	0.253
Theta hat (MLE)	81.64	Theta star (bias corrected MLE)	83
nu hat (MLE)	12.87	nu star (bias corrected)	12.66
Adjusted Level of Significance (β)	0.0395		
Approximate Chi Square Value (12.66, α)	5.665	Adjusted Chi Square Value (12.66, β)	5.348
95% Gamma Approximate UCL (use when n>=50)	46.97	95% Gamma Adjusted UCL (use when n<50)	49.75

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	23.61	SD (KM)	34.07
Variance (KM)	1161	SE of Mean (KM)	7.039
k hat (KM)	0.48	k star (KM)	0.449
nu hat (KM)	24	nu star (KM)	22.45
theta hat (KM)	49.18	theta star (KM)	52.57
80% gamma percentile (KM)	38.53	90% gamma percentile (KM)	65.26
95% gamma percentile (KM)	94.2	99% gamma percentile (KM)	166.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.45, α)	12.68	Adjusted Chi Square Value (22.45, β)	12.18
95% Gamma Approximate KM-UCL (use when n>=50)	41.81	95% Gamma Adjusted KM-UCL (use when n<50)	43.53

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.895	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	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	22.04	Mean in Log Scale	2.332
SD in Original Scale	35.6	SD in Log Scale	1.207
95% t UCL (assumes normality of ROS data)	34.22	95% Percentile Bootstrap UCL	34.33
95% BCA Bootstrap UCL	41.2	95% Bootstrap t UCL	48.05
95% H-UCL (Log ROS)	42.22		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.668	KM Geo Mean	14.41
KM SD (logged)	0.853	95% Critical H Value (KM-Log)	2.316
KM Standard Error of Mean (logged)	0.176	95% H-UCL (KM -Log)	31.02
KM SD (logged)	0.853	95% Critical H Value (KM-Log)	2.316
KM Standard Error of Mean (logged)	0.176		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	22.43	Mean in Log Scale	2.446
SD in Original Scale	35.39	SD in Log Scale	1.085
95% t UCL (Assumes normality)	34.54	95% H-Stat UCL	37

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

KM H-UCL	**31.02**

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.

beta-BHC (1)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.041	Minimum Non-Detect	0.11
Maximum Detect	0.49	Maximum Non-Detect	0.25
Variance Detects	0.0302	Percent Non-Detects	25%
Mean Detects	0.173	SD Detects	0.174
Median Detects	0.121	CV Detects	1.004
Skewness Detects	1.471	Kurtosis Detects	2.069
Mean of Logged Detects	-2.186	SD of Logged Detects	1.029

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.808	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.259	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	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

KM Mean	0.148	KM Standard Error of Mean	0.0581
KM SD	0.147	95% KM (BCA) UCL	0.252
95% KM (t) UCL	0.258	95% KM (Percentile Bootstrap) UCL	0.244
95% KM (z) UCL	0.244	95% KM Bootstrap t UCL	0.332
90% KM Chebyshev UCL	0.322	95% KM Chebyshev UCL	0.401
97.5% KM Chebyshev UCL	0.511	99% KM Chebyshev UCL	0.726

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.49	Anderson-Darling GOF Test	
5% A-D Critical Value	0.711	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.3	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.339	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)	1.297	k star (bias corrected MLE)	0.76
Theta hat (MLE)	0.133	Theta star (bias corrected MLE)	0.228
nu hat (MLE)	15.57	nu star (bias corrected)	9.118
Mean (detects)	0.173		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.041	Mean	0.146
Maximum	0.49	Median	0.0688
SD	0.156	CV	1.068
k hat (MLE)	1.339	k star (bias corrected MLE)	0.92
Theta hat (MLE)	0.109	Theta star (bias corrected MLE)	0.159
nu hat (MLE)	21.43	nu star (bias corrected)	14.73
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (14.73, α)	7.071	Adjusted Chi Square Value (14.73, β)	5.784
95% Gamma Approximate UCL (use when n>=50)	0.304	95% Gamma Adjusted UCL (use when n<50)	0.372

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.148	SD (KM)	0.147
Variance (KM)	0.0217	SE of Mean (KM)	0.0581
k hat (KM)	1.012	k star (KM)	0.716
nu hat (KM)	16.19	nu star (KM)	11.45
theta hat (KM)	0.146	theta star (KM)	0.207
80% gamma percentile (KM)	0.243	90% gamma percentile (KM)	0.37
95% gamma percentile (KM)	0.5	99% gamma percentile (KM)	0.81

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.45, α)	4.867	Adjusted Chi Square Value (11.45, β)	3.839
95% Gamma Approximate KM-UCL (use when n>=50)	0.348	95% Gamma Adjusted KM-UCL (use when n<50)	0.442

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.868	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.279	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	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	0.146	Mean in Log Scale	-2.324
SD in Original Scale	0.155	SD in Log Scale	0.913
95% t UCL (assumes normality of ROS data)	0.25	95% Percentile Bootstrap UCL	0.24
95% BCA Bootstrap UCL	0.274	95% Bootstrap t UCL	0.376
95% H-UCL (Log ROS)	0.451		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.346	KM Geo Mean	0.0957
KM SD (logged)	0.904	95% Critical H Value (KM-Log)	3.195
KM Standard Error of Mean (logged)	0.366	95% H-UCL (KM -Log)	0.429
KM SD (logged)	0.904	95% Critical H Value (KM-Log)	3.195
KM Standard Error of Mean (logged)	0.366		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.152	Mean in Log Scale	-2.262
SD in Original Scale	0.153	SD in Log Scale	0.908
95% t UCL (Assumes normality)	0.255	95% H-Stat UCL	0.472

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 **0.258**

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.

beta-BHC (2)

General Statistics

Total Number of Observations	30	Number of Distinct Observations	23
Number of Detects	10	Number of Non-Detects	20
Number of Distinct Detects	10	Number of Distinct Non-Detects	16
Minimum Detect	0.0037	Minimum Non-Detect	0.0036
Maximum Detect	1.7	Maximum Non-Detect	0.24
Variance Detects	0.325	Percent Non-Detects	66.67%
Mean Detects	0.426	SD Detects	0.57
Median Detects	0.125	CV Detects	1.338
Skewness Detects	1.527	Kurtosis Detects	1.633
Mean of Logged Detects	-2.033	SD of Logged Detects	1.937

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.765	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.298	Lilliefors GOF Test
5% Lilliefors Critical Value	0.262	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

KM Mean	0.149	KM Standard Error of Mean	0.0711
KM SD	0.369	95% KM (BCA) UCL	0.276
95% KM (t) UCL	0.27	95% KM (Percentile Bootstrap) UCL	0.271
95% KM (z) UCL	0.266	95% KM Bootstrap t UCL	0.373
90% KM Chebyshev UCL	0.362	95% KM Chebyshev UCL	0.459
97.5% KM Chebyshev UCL	0.593	99% KM Chebyshev UCL	0.856

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.291	Anderson-Darling GOF Test
5% A-D Critical Value	0.774	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.195	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.28	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)	0.533	k star (bias corrected MLE)	0.44
Theta hat (MLE)	0.799	Theta star (bias corrected MLE)	0.969
nu hat (MLE)	10.66	nu star (bias corrected)	8.795
Mean (detects)	0.426		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0037	Mean	0.149
Maximum	1.7	Median	0.01
SD	0.375	CV	2.522
k hat (MLE)	0.363	k star (bias corrected MLE)	0.349
Theta hat (MLE)	0.41	Theta star (bias corrected MLE)	0.426
nu hat (MLE)	21.78	nu star (bias corrected)	20.93
Adjusted Level of Significance (β)	0.041		
Approximate Chi Square Value (20.93, α)	11.54	Adjusted Chi Square Value (20.93, β)	11.14
95% Gamma Approximate UCL (use when n>=50)	0.27	95% Gamma Adjusted UCL (use when n<50)	0.279

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.149	SD (KM)	0.369
Variance (KM)	0.136	SE of Mean (KM)	0.0711
k hat (KM)	0.163	k star (KM)	0.169
nu hat (KM)	9.793	nu star (KM)	10.15
theta hat (KM)	0.913	theta star (KM)	0.881
80% gamma percentile (KM)	0.177	90% gamma percentile (KM)	0.448
95% gamma percentile (KM)	0.8	99% gamma percentile (KM)	1.798

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.15, α)	4.034	Adjusted Chi Square Value (10.15, β)	3.813
95% Gamma Approximate KM-UCL (use when n>=50)	0.375	95% Gamma Adjusted KM-UCL (use when n<50)	0.396

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.953	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.164	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	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	0.144	Mean in Log Scale	-4.701
SD in Original Scale	0.377	SD in Log Scale	2.333
95% t UCL (assumes normality of ROS data)	0.261	95% Percentile Bootstrap UCL	0.264
95% BCA Bootstrap UCL	0.315	95% Bootstrap t UCL	0.388
95% H-UCL (Log ROS)	0.958		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.133	KM Geo Mean	0.016
KM SD (logged)	1.961	95% Critical H Value (KM-Log)	3.873
KM Standard Error of Mean (logged)	0.428	95% H-UCL (KM -Log)	0.449
KM SD (logged)	1.961	95% Critical H Value (KM-Log)	3.873
KM Standard Error of Mean (logged)	0.428		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.169	Mean in Log Scale	-3.144
SD in Original Scale	0.369	SD in Log Scale	1.624
95% t UCL (Assumes normality)	0.284	95% H-Stat UCL	0.443

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

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	**0.396**

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.

beta-BHC (3)

General Statistics			
Total Number of Observations	22	Number of Distinct Observations	18
Number of Detects	1	Number of Non-Detects	21
Number of Distinct Detects	1	Number of Distinct Non-Detects	17

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 beta-BHC (3) was not processed!

beta-BHC (4)

General Statistics			
Total Number of Observations	25	Number of Distinct Observations	17
Number of Detects	3	Number of Non-Detects	22
Number of Distinct Detects	3	Number of Distinct Non-Detects	14
Minimum Detect	0.016	Minimum Non-Detect	0.0021
Maximum Detect	0.46	Maximum Non-Detect	0.26
Variance Detects	0.0562	Percent Non-Detects	88%
Mean Detects	0.19	SD Detects	0.237
Median Detects	0.094	CV Detects	1.248
Skewness Detects	1.523	Kurtosis Detects	N/A
Mean of Logged Detects	-2.425	SD of Logged Detects	1.68

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	0.877	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.324	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	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			
KM Mean	0.026	KM Standard Error of Mean	0.0224
KM SD	0.0909	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0643	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0628	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0932	95% KM Chebyshev UCL	0.124
97.5% KM Chebyshev UCL	0.166	99% KM Chebyshev UCL	0.249

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.779	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.244	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.673	nu star (bias corrected)	N/A
Mean (detects)	0.19		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0316
Maximum	0.46	Median	0.01
SD	0.0908	CV	2.874
k hat (MLE)	0.682	k star (bias corrected MLE)	0.627
Theta hat (MLE)	0.0463	Theta star (bias corrected MLE)	0.0504
nu hat (MLE)	34.11	nu star (bias corrected)	31.35
Adjusted Level of Significance (β)	0.0395		
Approximate Chi Square Value (31.35, α)	19.56	Adjusted Chi Square Value (31.35, β)	18.92
95% Gamma Approximate UCL (use when n>=50)	0.0507	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.026	SD (KM)	0.0909
Variance (KM)	0.00826	SE of Mean (KM)	0.0224
k hat (KM)	0.0816	k star (KM)	0.0985
nu hat (KM)	4.082	nu star (KM)	4.925
theta hat (KM)	0.318	theta star (KM)	0.264
80% gamma percentile (KM)	0.0176	90% gamma percentile (KM)	0.0687
95% gamma percentile (KM)	0.151	99% gamma percentile (KM)	0.416

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.93, α)	1.118	Adjusted Chi Square Value (4.93, β)	1.001
95% Gamma Approximate KM-UCL (use when n>=50)	0.114	95% Gamma Adjusted KM-UCL (use when n<50)	0.128

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.999	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	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	0.0231	Mean in Log Scale	-8.058
SD in Original Scale	0.093	SD in Log Scale	2.521
95% t UCL (assumes normality of ROS data)	0.0549	95% Percentile Bootstrap UCL	0.0593
95% BCA Bootstrap UCL	0.0826	95% Bootstrap t UCL	0.676
95% H-UCL (Log ROS)	0.0913		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.626	KM Geo Mean	0.0036
KM SD (logged)	1.367	95% Critical H Value (KM-Log)	2.997
KM Standard Error of Mean (logged)	0.363	95% H-UCL (KM -Log)	0.0212
KM SD (logged)	1.367	95% Critical H Value (KM-Log)	2.997
KM Standard Error of Mean (logged)	0.363		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0509	Mean in Log Scale	-4.516
SD in Original Scale	0.0975	SD in Log Scale	1.88
95% t UCL (Assumes normality)	0.0843	95% H-Stat UCL	0.274

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	0.0643

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.

Dieldrin (1)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.081	Minimum Non-Detect	0.21
Maximum Detect	2.1	Maximum Non-Detect	0.5
Variance Detects	0.918	Percent Non-Detects	50%
Mean Detects	0.69	SD Detects	0.958
Median Detects	0.289	CV Detects	1.389
Skewness Detects	1.791	Kurtosis Detects	3.186
Mean of Logged Detects	-1.207	SD of Logged Detects	1.525

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.765	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.337	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.398	KM Standard Error of Mean	0.269
KM SD	0.658	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.908	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.841	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.206	95% KM Chebyshev UCL	1.572
97.5% KM Chebyshev UCL	2.081	99% KM Chebyshev UCL	3.079

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.404	Anderson-Darling GOF Test	
5% A-D Critical Value	0.672	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.297	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.406	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)	0.72	k star (bias corrected MLE)	0.347
Theta hat (MLE)	0.957	Theta star (bias corrected MLE)	1.989
nu hat (MLE)	5.763	nu star (bias corrected)	2.774
Mean (detects)	0.69		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.356
Maximum	2.1	Median	0.069
SD	0.722	CV	2.029
k hat (MLE)	0.398	k star (bias corrected MLE)	0.332
Theta hat (MLE)	0.894	Theta star (bias corrected MLE)	1.071
nu hat (MLE)	6.367	nu star (bias corrected)	5.313
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.31, α)	1.299	Adjusted Chi Square Value (5.31, β)	0.866
95% Gamma Approximate UCL (use when n>=50)	1.455	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.398	SD (KM)	0.658
Variance (KM)	0.433	SE of Mean (KM)	0.269
k hat (KM)	0.366	k star (KM)	0.312
nu hat (KM)	5.853	nu star (KM)	4.991
theta hat (KM)	1.087	theta star (KM)	1.275
80% gamma percentile (KM)	0.616	90% gamma percentile (KM)	1.167
95% gamma percentile (KM)	1.797	99% gamma percentile (KM)	3.424

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.99, α)	1.148	Adjusted Chi Square Value (4.99, β)	0.752
95% Gamma Approximate KM-UCL (use when n>=50)	1.729	95% Gamma Adjusted KM-UCL (use when n<50)	2.641

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.899	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.268	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	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	0.396	Mean in Log Scale	-1.744
SD in Original Scale	0.701	SD in Log Scale	1.155
95% t UCL (assumes normality of ROS data)	0.866	95% Percentile Bootstrap UCL	0.851
95% BCA Bootstrap UCL	1.098	95% Bootstrap t UCL	15.38
95% H-UCL (Log ROS)	1.804		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.777	KM Geo Mean	0.169
KM SD (logged)	1.122	95% Critical H Value (KM-Log)	3.732
KM Standard Error of Mean (logged)	0.47	95% H-UCL (KM -Log)	1.543
KM SD (logged)	1.122	95% Critical H Value (KM-Log)	3.732
KM Standard Error of Mean (logged)	0.47		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.417	Mean in Log Scale	-1.605
SD in Original Scale	0.693	SD in Log Scale	1.118
95% t UCL (Assumes normality)	0.882	95% H-Stat UCL	1.81

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 **0.908**

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.

Dieldrin (2)

General Statistics

Total Number of Observations	30	Number of Distinct Observations	26
Number of Detects	10	Number of Non-Detects	20
Number of Distinct Detects	10	Number of Distinct Non-Detects	17
Minimum Detect	0.018	Minimum Non-Detect	0.024
Maximum Detect	1.5	Maximum Non-Detect	0.47
Variance Detects	0.282	Percent Non-Detects	66.67%
Mean Detects	0.514	SD Detects	0.531
Median Detects	0.415	CV Detects	1.035
Skewness Detects	0.98	Kurtosis Detects	-0.175
Mean of Logged Detects	-1.467	SD of Logged Detects	1.581

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.859	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.188	Lilliefors GOF Test
5% Lilliefors Critical Value	0.262	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

KM Mean	0.192	KM Standard Error of Mean	0.0717
KM SD	0.371	95% KM (BCA) UCL	0.312
95% KM (t) UCL	0.314	95% KM (Percentile Bootstrap) UCL	0.314
95% KM (z) UCL	0.31	95% KM Bootstrap t UCL	0.384
90% KM Chebyshev UCL	0.407	95% KM Chebyshev UCL	0.505
97.5% KM Chebyshev UCL	0.64	99% KM Chebyshev UCL	0.906

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.311	Anderson-Darling GOF Test
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.276	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)	0.748	k star (bias corrected MLE)	0.59
Theta hat (MLE)	0.686	Theta star (bias corrected MLE)	0.87
nu hat (MLE)	14.97	nu star (bias corrected)	11.81
Mean (detects)	0.514		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.178
Maximum	1.5	Median	0.01
SD	0.382	CV	2.148
k hat (MLE)	0.365	k star (bias corrected MLE)	0.35
Theta hat (MLE)	0.488	Theta star (bias corrected MLE)	0.508
nu hat (MLE)	21.88	nu star (bias corrected)	21.02
Adjusted Level of Significance (β)	0.041		
Approximate Chi Square Value (21.02, α)	11.61	Adjusted Chi Square Value (21.02, β)	11.2
95% Gamma Approximate UCL (use when n>=50)	0.322	95% Gamma Adjusted UCL (use when n<50)	0.334

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.192	SD (KM)	0.371
Variance (KM)	0.137	SE of Mean (KM)	0.0717
k hat (KM)	0.268	k star (KM)	0.264
nu hat (KM)	16.09	nu star (KM)	15.81
theta hat (KM)	0.716	theta star (KM)	0.729
80% gamma percentile (KM)	0.284	90% gamma percentile (KM)	0.574
95% gamma percentile (KM)	0.915	99% gamma percentile (KM)	1.815

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.81, α)	7.831	Adjusted Chi Square Value (15.81, β)	7.507
95% Gamma Approximate KM-UCL (use when n>=50)	0.388	95% Gamma Adjusted KM-UCL (use when n<50)	0.404

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.915	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.211	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	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	0.187	Mean in Log Scale	-3.032
SD in Original Scale	0.378	SD in Log Scale	1.478
95% t UCL (assumes normality of ROS data)	0.304	95% Percentile Bootstrap UCL	0.304
95% BCA Bootstrap UCL	0.346	95% Bootstrap t UCL	0.4
95% H-UCL (Log ROS)	0.34		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.948	KM Geo Mean	0.0525
KM SD (logged)	1.424	95% Critical H Value (KM-Log)	3.054
KM Standard Error of Mean (logged)	0.305	95% H-UCL (KM -Log)	0.324
KM SD (logged)	1.424	95% Critical H Value (KM-Log)	3.054
KM Standard Error of Mean (logged)	0.305		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.233	Mean in Log Scale	-2.355
SD in Original Scale	0.364	SD in Log Scale	1.344
95% t UCL (Assumes normality)	0.346	95% H-Stat UCL	0.488

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	**0.314**

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.

Dieldrin (3)

General Statistics			
Total Number of Observations	22	Number of Distinct Observations	18
Number of Detects	3	Number of Non-Detects	19
Number of Distinct Detects	3	Number of Distinct Non-Detects	15
Minimum Detect	0.016	Minimum Non-Detect	0.0048
Maximum Detect	0.35	Maximum Non-Detect	0.49
Variance Detects	0.0299	Percent Non-Detects	86.36%
Mean Detects	0.209	SD Detects	0.173
Median Detects	0.26	CV Detects	0.828
Skewness Detects	-1.219	Kurtosis Detects	N/A
Mean of Logged Detects	-2.177	SD of Logged Detects	1.702

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	0.934	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.283	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	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			
KM Mean	0.0401	KM Standard Error of Mean	0.0275
KM SD	0.0949	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0874	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0853	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.123	95% KM Chebyshev UCL	0.16
97.5% KM Chebyshev UCL	0.212	99% KM Chebyshev UCL	0.313

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.951	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.219	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.708	nu star (bias corrected)	N/A
Mean (detects)	0.209		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.0371
Maximum	0.35	Median	0.01
SD	0.0878	CV	2.368
k hat (MLE)	0.627	k star (bias corrected MLE)	0.572
Theta hat (MLE)	0.0592	Theta star (bias corrected MLE)	0.0649
nu hat (MLE)	27.57	nu star (bias corrected)	25.15
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (25.15, α)	14.72	Adjusted Chi Square Value (25.15, β)	14.13
95% Gamma Approximate UCL (use when n>=50)	0.0633	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.0401	SD (KM)	0.0949
Variance (KM)	0.00901	SE of Mean (KM)	0.0275
k hat (KM)	0.179	k star (KM)	0.185
nu hat (KM)	7.87	nu star (KM)	8.13
theta hat (KM)	0.224	theta star (KM)	0.217
80% gamma percentile (KM)	0.0506	90% gamma percentile (KM)	0.121
95% gamma percentile (KM)	0.211	99% gamma percentile (KM)	0.462

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (8.13, α)	2.811	Adjusted Chi Square Value (8.13, β)	2.582
95% Gamma Approximate KM-UCL (use when n>=50)	0.116	95% Gamma Adjusted KM-UCL (use when n<50)	0.126

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.822	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.354	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	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	0.0293	Mean in Log Scale	-6.675
SD in Original Scale	0.0904	SD in Log Scale	2.108
95% t UCL (assumes normality of ROS data)	0.0625	95% Percentile Bootstrap UCL	0.0647
95% BCA Bootstrap UCL	0.0771	95% Bootstrap t UCL	0.775
95% H-UCL (Log ROS)	0.0871		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.665	KM Geo Mean	0.00942
KM SD (logged)	1.308	95% Critical H Value (KM-Log)	3.037
KM Standard Error of Mean (logged)	0.425	95% H-UCL (KM -Log)	0.0527
KM SD (logged)	1.308	95% Critical H Value (KM-Log)	3.037
KM Standard Error of Mean (logged)	0.425		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0921	Mean in Log Scale	-3.313
SD in Original Scale	0.11	SD in Log Scale	1.536
95% t UCL (Assumes normality)	0.133	95% H-Stat UCL	0.37

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	0.0874

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.

Dieldrin (4)

General Statistics

Total Number of Observations	25	Number of Distinct Observations	22
Number of Detects	2	Number of Non-Detects	23
Number of Distinct Detects	2	Number of Distinct Non-Detects	20
Minimum Detect	0.15	Minimum Non-Detect	0.0041
Maximum Detect	1.1	Maximum Non-Detect	0.51
Variance Detects	0.451	Percent Non-Detects	92%
Mean Detects	0.625	SD Detects	0.672
Median Detects	0.625	CV Detects	1.075
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.901	SD of Logged Detects	1.409

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

KM Mean	0.0553	KM Standard Error of Mean	0.0612
KM SD	0.216	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.16	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.156	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.239	95% KM Chebyshev UCL	0.322
97.5% KM Chebyshev UCL	0.437	99% KM Chebyshev UCL	0.664

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.302	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.48	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.207	nu star (bias corrected)	N/A
Mean (detects)	0.625		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0553	SD (KM)	0.216
Variance (KM)	0.0465	SE of Mean (KM)	0.0612
k hat (KM)	0.0658	k star (KM)	0.0846
nu hat (KM)	3.29	nu star (KM)	4.228
theta hat (KM)	0.841	theta star (KM)	0.654
80% gamma percentile (KM)	0.0292	90% gamma percentile (KM)	0.136
95% gamma percentile (KM)	0.322	99% gamma percentile (KM)	0.954

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0395
Approximate Chi Square Value (4.23, α)	0.814	Adjusted Chi Square Value (4.23, β)	0.72
95% Gamma Approximate KM-UCL (use when n>=50)	0.287	95% Gamma Adjusted KM-UCL (use when n<50)	0.325

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

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	0.0505	Mean in Log Scale	-7.28
SD in Original Scale	0.221	SD in Log Scale	2.074
95% t UCL (assumes normality of ROS data)	0.126	95% Percentile Bootstrap UCL	0.138
95% BCA Bootstrap UCL	0.183	95% Bootstrap t UCL	26.78
95% H-UCL (Log ROS)	0.0335		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.091	KM Geo Mean	0.00615
KM SD (logged)	1.319	95% Critical H Value (KM-Log)	2.928
KM Standard Error of Mean (logged)	0.39	95% H-UCL (KM -Log)	0.0323
KM SD (logged)	1.319	95% Critical H Value (KM-Log)	2.928
KM Standard Error of Mean (logged)	0.39		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.106	Mean in Log Scale	-3.864
SD in Original Scale	0.227	SD in Log Scale	1.883
95% t UCL (Assumes normality)	0.184	95% H-Stat UCL	0.529

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 (Chebyshev) UCL	0.322

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.

Heptachlor (1)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	600.00%
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (1) was not processed!

Heptachlor (2)

General Statistics			
Total Number of Observations	30	Number of Distinct Observations	22
Number of Detects	2	Number of Non-Detects	28
Number of Distinct Detects	2	Number of Distinct Non-Detects	20
Minimum Detect	0.012	Minimum Non-Detect	0.002
Maximum Detect	0.42	Maximum Non-Detect	0.24
Variance Detects	0.0832	Percent Non-Detects	93.33%
Mean Detects	0.216	SD Detects	0.288
Median Detects	0.216	CV Detects	1.336
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.645	SD of Logged Detects	2.514

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			
KM Mean	0.0184	KM Standard Error of Mean	0.0195
KM SD	0.0747	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0515	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0504	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0768	95% KM Chebyshev UCL	0.103
97.5% KM Chebyshev UCL	0.14	99% KM Chebyshev UCL	0.212

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.561	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.385	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.244	nu star (bias corrected)	N/A
Mean (detects)	0.216		

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.0184	SD (KM)	0.0747
Variance (KM)	0.00558	SE of Mean (KM)	0.0195
k hat (KM)	0.0603	k star (KM)	0.0765
nu hat (KM)	3.62	nu star (KM)	4.591
theta hat (KM)	0.304	theta star (KM)	0.24
80% gamma percentile (KM)	0.00799	90% gamma percentile (KM)	0.0423
95% gamma percentile (KM)	0.106	99% gamma percentile (KM)	0.332

Gamma Kaplan-Meier (KM) Statistics			
		Adjusted Level of Significance (β)	0.041
Approximate Chi Square Value (4.59, α)	0.968	Adjusted Chi Square Value (4.59, β)	0.878
95% Gamma Approximate KM-UCL (use when n>=50)	0.087	95% Gamma Adjusted KM-UCL (use when n<50)	0.0959
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

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	0.0151	Mean in Log Scale	-7.585
SD in Original Scale	0.0765	SD in Log Scale	1.834
95% t UCL (assumes normality of ROS data)	0.0388	95% Percentile Bootstrap UCL	0.0428
95% BCA Bootstrap UCL	0.0586	95% Bootstrap t UCL	0.923
95% H-UCL (Log ROS)	0.00955		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-5.603	KM Geo Mean	0.00369
KM SD (logged)	1.164	95% Critical H Value (KM-Log)	2.691
KM Standard Error of Mean (logged)	0.577	95% H-UCL (KM -Log)	0.013
KM SD (logged)	1.164	95% Critical H Value (KM-Log)	2.691
KM Standard Error of Mean (logged)	0.577		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0525	Mean in Log Scale	-3.661
SD in Original Scale	0.0785	SD in Log Scale	1.29
95% t UCL (Assumes normality)	0.0769	95% H-Stat UCL	0.117

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 0.14

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.

Heptachlor (3)

General Statistics

Total Number of Observations	22	Number of Distinct Observations	17
Number of Detects	1	Number of Non-Detects	21
Number of Distinct Detects	1	Number of Distinct Non-Detects	17

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 Heptachlor (3) was not processed!

Heptachlor (4)

General Statistics

Total Number of Observations	25	Number of Distinct Observations	17
Number of Detects	1	Number of Non-Detects	24
Number of Distinct Detects	1	Number of Distinct Non-Detects	16

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 Heptachlor (4) was not processed!

Lead (1)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	59.1	**Mean**	**298.1**
Maximum	551	Median	321.5
SD	176.8	Std. Error of Mean	62.5
Coefficient of Variation	0.593	Skewness	-0.114

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.151	Lilliefors GOF Test
5% Lilliefors Critical Value	0.283	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	416.5	95% Adjusted-CLT UCL (Chen-1995)	398.2
		95% Modified-t UCL (Johnson-1978)	416

Gamma GOF Test			
A-D Test Statistic	0.478	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.216	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.297	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.215	k star (bias corrected MLE)	1.468
Theta hat (MLE)	134.6	Theta star (bias corrected MLE)	203.1
nu hat (MLE)	35.44	nu star (bias corrected)	23.48
MLE Mean (bias corrected)	298.1	MLE Sd (bias corrected)	246
		Approximate Chi Square Value (0.05)	13.45
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	11.58
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	520.2	95% Adjusted Gamma UCL (use when n<50)	604.3
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.239	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	4.079	Mean of logged Data	5.455
Maximum of Logged Data	6.312	SD of logged Data	0.845
Assuming Lognormal Distribution			
95% H-UCL	885.6	90% Chebyshev (MVUE) UCL	605.3
95% Chebyshev (MVUE) UCL	736.1	97.5% Chebyshev (MVUE) UCL	917.8
99% Chebyshev (MVUE) UCL	1275		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	400.9	95% Jackknife UCL	416.5
95% Standard Bootstrap UCL	396.1	95% Bootstrap-t UCL	416.3
95% Hall's Bootstrap UCL	404	95% Percentile Bootstrap UCL	392.9
95% BCA Bootstrap UCL	391.8		
90% Chebyshev(Mean, Sd) UCL	485.5	95% Chebyshev(Mean, Sd) UCL	570.5
97.5% Chebyshev(Mean, Sd) UCL	688.4	99% Chebyshev(Mean, Sd) UCL	919.9
Suggested UCL to Use			
95% Student's-t UCL	416.5		

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.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Lead (2)

General Statistics			
Total Number of Observations	30	Number of Distinct Observations	30
		Number of Missing Observations	0
Minimum	14.9	**Mean**	**336.5**
Maximum	1350	Median	129
SD	398.2	Std. Error of Mean	72.69
Coefficient of Variation	1.183	Skewness	1.279
Normal GOF Test			
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.927	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.251	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.159	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	460	95% Adjusted-CLT UCL (Chen-1995)	474.2
		95% Modified-t UCL (Johnson-1978)	462.8
Gamma GOF Test			
A-D Test Statistic	1.165	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.786	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.16	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.166	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.79	k star (bias corrected MLE)	0.734
Theta hat (MLE)	425.8	Theta star (bias corrected MLE)	458.7
nu hat (MLE)	47.42	nu star (bias corrected)	44.01
MLE Mean (bias corrected)	336.5	MLE Sd (bias corrected)	392.9
		Approximate Chi Square Value (0.05)	29.8
Adjusted Level of Significance	0.041	Adjusted Chi Square Value	29.12
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	497	95% Adjusted Gamma UCL (use when n<50)	508.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.934	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.927	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.111	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.159	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.701	Mean of logged Data	5.066
Maximum of Logged Data	7.208	SD of logged Data	1.3
Assuming Lognormal Distribution			
95% H-UCL	738.8	90% Chebyshev (MVUE) UCL	656.8
95% Chebyshev (MVUE) UCL	794.9	97.5% Chebyshev (MVUE) UCL	986.8
99% Chebyshev (MVUE) UCL	1364		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	456.1	95% Jackknife UCL	460
95% Standard Bootstrap UCL	455	95% Bootstrap-t UCL	487.8
95% Hall's Bootstrap UCL	462.6	95% Percentile Bootstrap UCL	463.6
95% BCA Bootstrap UCL	470.2		
90% Chebyshev(Mean, Sd) UCL	554.6	95% Chebyshev(Mean, Sd) UCL	653.4
97.5% Chebyshev(Mean, Sd) UCL	790.5	99% Chebyshev(Mean, Sd) UCL	1060

Suggested UCL to Use
95% Adjusted Gamma UCL 508.5

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Lead (3)

General Statistics

Total Number of Observations	22	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	22.6	**Mean**	**285.7**
Maximum	1020	Median	181.5
SD	273.7	Std. Error of Mean	58.36
Coefficient of Variation	0.958	Skewness	1.657

Normal GOF Test

Shapiro Wilk Test Statistic	0.79	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.911	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.229	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.184	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	386.1	95% Adjusted-CLT UCL (Chen-1995)	403.7
		95% Modified-t UCL (Johnson-1978)	389.5

Gamma GOF Test

A-D Test Statistic	0.41	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.154	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.189	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.381	k star (bias corrected MLE)	1.223
Theta hat (MLE)	206.8	Theta star (bias corrected MLE)	233.6
nu hat (MLE)	60.77	nu star (bias corrected)	53.82
MLE Mean (bias corrected)	285.7	MLE Sd (bias corrected)	258.3
		Approximate Chi Square Value (0.05)	37.96
Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	36.97

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	405	95% Adjusted Gamma UCL (use when n<50)	415.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.977	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.911	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0948	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.184	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	3.118	Mean of logged Data	5.251
Maximum of Logged Data	6.928	SD of logged Data	0.954

Assuming Lognormal Distribution

95% H-UCL	508.2	90% Chebyshev (MVUE) UCL	491.6
95% Chebyshev (MVUE) UCL	581.9	97.5% Chebyshev (MVUE) UCL	707.2
99% Chebyshev (MVUE) UCL	953.4		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	381.7	95% Jackknife UCL	386.1
95% Standard Bootstrap UCL	379.7	95% Bootstrap-t UCL	424.7
95% Hall's Bootstrap UCL	430.9	95% Percentile Bootstrap UCL	383.6
95% BCA Bootstrap UCL	400.6		
90% Chebyshev(Mean, Sd) UCL	460.8	95% Chebyshev(Mean, Sd) UCL	540.1
97.5% Chebyshev(Mean, Sd) UCL	650.2	99% Chebyshev(Mean, Sd) UCL	866.4

Suggested UCL to Use	
95% Adjusted Gamma UCL	415.9

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.

Lead (4)

General Statistics			
Total Number of Observations	25	Number of Distinct Observations	25
		Number of Missing Observations	0
Minimum	33.7	**Mean**	**270.9**
Maximum	1030	Median	210
SD	268.1	Std. Error of Mean	53.63
Coefficient of Variation	0.99	Skewness	1.823

Normal GOF Test		
Shapiro Wilk Test Statistic	0.778	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.188	Lilliefors GOF Test
5% Lilliefors Critical Value	0.173	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	362.6	95% Adjusted-CLT UCL (Chen-1995)	380
		95% Modified-t UCL (Johnson-1978)	365.9

Gamma GOF Test		
A-D Test Statistic	0.391	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.766	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.104	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.178	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	1.318	k star (bias corrected MLE)	1.186
Theta hat (MLE)	205.6	Theta star (bias corrected MLE)	228.4
nu hat (MLE)	65.88	nu star (bias corrected)	59.3
MLE Mean (bias corrected)	270.9	MLE Sd (bias corrected)	248.7
		Approximate Chi Square Value (0.05)	42.6
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	41.63

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	377.1	95% Adjusted Gamma UCL (use when n<50)	385.9

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0906	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.173	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	3.517	Mean of logged Data	5.176
Maximum of Logged Data	6.937	SD of logged Data	0.959

Assuming Lognormal Distribution

95% H-UCL	452.5	90% Chebyshev (MVUE) UCL	450.8
95% Chebyshev (MVUE) UCL	531.1	97.5% Chebyshev (MVUE) UCL	642.7
99% Chebyshev (MVUE) UCL	861.8		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	359.1	95% Jackknife UCL	362.6
95% Standard Bootstrap UCL	356.1	95% Bootstrap-t UCL	415.3
95% Hall's Bootstrap UCL	450	95% Percentile Bootstrap UCL	366
95% BCA Bootstrap UCL	382		
90% Chebyshev(Mean, Sd) UCL	431.8	95% Chebyshev(Mean, Sd) UCL	504.6
97.5% Chebyshev(Mean, Sd) UCL	605.8	99% Chebyshev(Mean, Sd) UCL	804.5

Suggested UCL to Use

95% Adjusted Gamma UCL	385.9

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.

ATTACHMENT C

UCL Statistics for Data Sets with Non-Detects
Whole Estech Site - Post-Corrective Action

User Selected Options	
Date/Time of Computation	ProUCL 5.16/22/2018 1:02:42 PM
From File	COC List UCL Input For Mapping_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDT

General Statistics

Total Number of Observations	85	Number of Distinct Observations	72
Number of Detects	67	Number of Non-Detects	18
Number of Distinct Detects	55	Number of Distinct Non-Detects	17
Minimum Detect	0.012	Minimum Non-Detect	0.0041
Maximum Detect	82	Maximum Non-Detect	0.48
Variance Detects	107.2	Percent Non-Detects	21.18%
Mean Detects	3.368	SD Detects	10.35
Median Detects	0.78	CV Detects	3.074
Skewness Detects	6.917	Kurtosis Detects	52.24
Mean of Logged Detects	-0.386	SD of Logged Detects	1.899

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.322	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.108	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

KM Mean	2.66	KM Standard Error of Mean	1.008
KM SD	9.223	95% KM (BCA) UCL	4.564
95% KM (t) UCL	4.337	95% KM (Percentile Bootstrap) UCL	4.65
95% KM (z) UCL	4.318	95% KM Bootstrap t UCL	7.481
90% KM Chebyshev UCL	5.684	95% KM Chebyshev UCL	7.054
97.5% KM Chebyshev UCL	8.955	99% KM Chebyshev UCL	12.69

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.902	Anderson-Darling GOF Test	
5% A-D Critical Value	0.838	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.117	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.117	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)	0.41	k star (bias corrected MLE)	0.401
Theta hat (MLE)	8.223	Theta star (bias corrected MLE)	8.395
nu hat (MLE)	54.89	nu star (bias corrected)	53.76
Mean (detects)	3.368		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.657
Maximum	82	Median	0.3
SD	9.279	CV	3.492
k hat (MLE)	0.305	k star (bias corrected MLE)	0.302
Theta hat (MLE)	8.717	Theta star (bias corrected MLE)	8.801
nu hat (MLE)	51.81	nu star (bias corrected)	51.32
Adjusted Level of Significance (β)	0.0472		
Approximate Chi Square Value (51.32, α)	35.86	Adjusted Chi Square Value (51.32, β)	35.64
95% Gamma Approximate UCL (use when n>=50)	3.801	95% Gamma Adjusted UCL (use when n<50)	3.825

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.66	SD (KM)	9.223
Variance (KM)	85.07	SE of Mean (KM)	1.008
k hat (KM)	0.0832	k star (KM)	0.0881
nu hat (KM)	14.14	nu star (KM)	14.98
theta hat (KM)	31.98	theta star (KM)	30.2
80% gamma percentile (KM)	1.511	90% gamma percentile (KM)	6.67
95% gamma percentile (KM)	15.5	99% gamma percentile (KM)	44.98

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.98, α)	7.245	Adjusted Chi Square Value (14.98, β)	7.152
95% Gamma Approximate KM-UCL (use when n>=50)	5.499	95% Gamma Adjusted KM-UCL (use when n<50)	5.57

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.977	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.532	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0752	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.108	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	2.66	Mean in Log Scale	-1.167
SD in Original Scale	9.278	SD in Log Scale	2.293
95% t UCL (assumes normality of ROS data)	4.333	95% Percentile Bootstrap UCL	4.482
95% BCA Bootstrap UCL	5.789	95% Bootstrap t UCL	7.732
95% H-UCL (Log ROS)	11.02		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.323	KM Geo Mean	0.266
KM SD (logged)	2.526	95% Critical H Value (KM-Log)	4.054
KM Standard Error of Mean (logged)	0.281	95% H-UCL (KM -Log)	19.79
KM SD (logged)	2.526	95% Critical H Value (KM-Log)	4.054
KM Standard Error of Mean (logged)	0.281		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.666	Mean in Log Scale	-1.191
SD in Original Scale	9.276	SD in Log Scale	2.417
95% t UCL (Assumes normality)	4.34	95% H-Stat UCL	15.8

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

KM H-UCL	**19.79**

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.

Arsenic

General Statistics

Total Number of Observations	85	Number of Distinct Observations	72
Number of Detects	56	Number of Non-Detects	29
Number of Distinct Detects	54	Number of Distinct Non-Detects	19
Minimum Detect	7.67	Minimum Non-Detect	7.14
Maximum Detect	170	Maximum Non-Detect	11.6
Variance Detects	934.6	Percent Non-Detects	34.12%
Mean Detects	33.4	SD Detects	30.57
Median Detects	23.65	CV Detects	0.915
Skewness Detects	2.31	Kurtosis Detects	699.00%
Mean of Logged Detects	3.194	SD of Logged Detects	0.779

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.763	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	1.24E-11	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.118	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

KM Mean	24.46	KM Standard Error of Mean	3.016
KM SD	27.55	95% KM (BCA) UCL	29.71
95% KM (t) UCL	29.47	95% KM (Percentile Bootstrap) UCL	29.81
95% KM (z) UCL	29.42	95% KM Bootstrap t UCL	30.89
90% KM Chebyshev UCL	33.5	95% KM Chebyshev UCL	37.6
97.5% KM Chebyshev UCL	43.29	99% KM Chebyshev UCL	54.46

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.169	Anderson-Darling GOF Test	
5% A-D Critical Value	0.766	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.112	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.121	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.739	k star (bias corrected MLE)	1.657
Theta hat (MLE)	19.21	Theta star (bias corrected MLE)	20.15
nu hat (MLE)	194.7	nu star (bias corrected)	185.6
Mean (detects)	33.4		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	22.01
Maximum	170	Median	12.5
SD	29.42	CV	1.337
k hat (MLE)	0.274	k star (bias corrected MLE)	0.272
Theta hat (MLE)	80.43	Theta star (bias corrected MLE)	80.96
nu hat (MLE)	46.52	nu star (bias corrected)	46.21
Adjusted Level of Significance (β)	0.0472		
Approximate Chi Square Value (46.21, α)	31.61	Adjusted Chi Square Value (46.21, β)	31.4
95% Gamma Approximate UCL (use when n>=50)	32.17	95% Gamma Adjusted UCL (use when n<50)	32.38

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	24.46	SD (KM)	27.55
Variance (KM)	759.1	SE of Mean (KM)	3.016
k hat (KM)	0.788	k star (KM)	0.768
nu hat (KM)	134	nu star (KM)	130.6
theta hat (KM)	31.04	theta star (KM)	31.84
80% gamma percentile (KM)	40.05	90% gamma percentile (KM)	60.06
95% gamma percentile (KM)	80.51	99% gamma percentile (KM)	129

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (130.57, α)	105.2	Adjusted Chi Square Value (130.57, β)	104.8
95% Gamma Approximate KM-UCL (use when n>=50)	30.36	95% Gamma Adjusted KM-UCL (use when n<50)	30.48

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.95	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0409	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.101	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.118	Detected Data appear 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	23.45	Mean in Log Scale	2.586
SD in Original Scale	28.39	SD in Log Scale	1.07
95% t UCL (assumes normality of ROS data)	28.57	95% Percentile Bootstrap UCL	28.93
95% BCA Bootstrap UCL	29.46	95% Bootstrap t UCL	29.85

95% H-UCL (Log ROS)	30.78		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.777	KM Geo Mean	16.08
KM SD (logged)	0.853	95% Critical H Value (KM-Log)	2.102
KM Standard Error of Mean (logged)	0.0934	95% H-UCL (KM -Log)	28.14
KM SD (logged)	0.853	95% Critical H Value (KM-Log)	2.102
KM Standard Error of Mean (logged)	0.0934		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	23.36	Mean in Log Scale	2.572
SD in Original Scale	28.44	SD in Log Scale	1.076
95% t UCL (Assumes normality)	28.49	95% H-Stat UCL	30.66

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	**30.36**	95% GROS Approximate Gamma UCL	32.17

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

beta-BHC

General Statistics

Total Number of Observations	85	Number of Distinct Observations	50
Number of Detects	20	Number of Non-Detects	65
Number of Distinct Detects	20	Number of Distinct Non-Detects	36
Minimum Detect	0.0037	Minimum Non-Detect	0.0021
Maximum Detect	1.7	Maximum Non-Detect	0.26
Variance Detects	0.186	Percent Non-Detects	76.47%
Mean Detects	0.296	SD Detects	0.431
Median Detects	0.115	CV Detects	1.457
Skewness Detects	2.267	Kurtosis Detects	5.35
Mean of Logged Detects	-2.181	SD of Logged Detects	1.549

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.688	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.27	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	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

KM Mean	0.0754	KM Standard Error of Mean	0.0267
KM SD	0.239	95% KM (BCA) UCL	0.12
95% KM (t) UCL	0.12	95% KM (Percentile Bootstrap) UCL	0.123
95% KM (z) UCL	0.119	95% KM Bootstrap t UCL	0.163
90% KM Chebyshev UCL	0.155	95% KM Chebyshev UCL	0.192
97.5% KM Chebyshev UCL	0.242	99% KM Chebyshev UCL	0.341

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.429	Anderson-Darling GOF Test	
5% A-D Critical Value	0.79	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.155	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.203	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)	0.635	k star (bias corrected MLE)	0.573
Theta hat (MLE)	0.466	Theta star (bias corrected MLE)	0.517
nu hat (MLE)	25.41	nu star (bias corrected)	22.93
Mean (detects)	0.296		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0037	Mean	0.0773
Maximum	1.7	Median	0.01
SD	0.239	CV	3.087
k hat (MLE)	0.439	k star (bias corrected MLE)	0.432
Theta hat (MLE)	0.176	Theta star (bias corrected MLE)	0.179
nu hat (MLE)	74.7	nu star (bias corrected)	73.39
Adjusted Level of Significance (β)	0.0472		
Approximate Chi Square Value (73.39, α)	54.66	Adjusted Chi Square Value (73.39, β)	54.39
95% Gamma Approximate UCL (use when n>=50)	0.104	95% Gamma Adjusted UCL (use when n<50)	0.104

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0754	SD (KM)	0.239
Variance (KM)	0.057	SE of Mean (KM)	0.0267
k hat (KM)	0.0999	k star (KM)	0.104
nu hat (KM)	16.99	nu star (KM)	17.72
theta hat (KM)	0.755	theta star (KM)	0.724
80% gamma percentile (KM)	0.0555	90% gamma percentile (KM)	0.204
95% gamma percentile (KM)	0.437	99% gamma percentile (KM)	1.174

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.72, α)	9.189	Adjusted Chi Square Value (17.72, β)	9.083
95% Gamma Approximate KM-UCL (use when n>=50)	0.145	95% Gamma Adjusted KM-UCL (use when n<50)	0.147

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.986	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0787	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	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	0.0718	Mean in Log Scale	-5.534
SD in Original Scale	0.24	SD in Log Scale	2.256
95% t UCL (assumes normality of ROS data)	0.115	95% Percentile Bootstrap UCL	0.117
95% BCA Bootstrap UCL	0.134	95% Bootstrap t UCL	0.155
95% H-UCL (Log ROS)	0.125		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.952	KM Geo Mean	0.00707
KM SD (logged)	1.882	95% Critical H Value (KM-Log)	3.224
KM Standard Error of Mean (logged)	0.239	95% H-UCL (KM -Log)	0.0806
KM SD (logged)	1.882	95% Critical H Value (KM-Log)	3.224
KM Standard Error of Mean (logged)	0.239		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0988	Mean in Log Scale	-3.723
SD in Original Scale	0.236	SD in Log Scale	1.759
95% t UCL (Assumes normality)	0.141	95% H-Stat UCL	0.205

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 Approximate Gamma UCL	**0.145**

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.

Dieldrin

General Statistics

Total Number of Observations	85	Number of Distinct Observations	63
Number of Detects	19	Number of Non-Detects	66
Number of Distinct Detects	19	Number of Distinct Non-Detects	46
Minimum Detect	0.016	Minimum Non-Detect	0.0041
Maximum Detect	2.1	Maximum Non-Detect	0.51
Variance Detects	0.346	Percent Non-Detects	77.65%
Mean Detects	0.514	SD Detects	0.589
Median Detects	0.35	CV Detects	1.144
Skewness Detects	1.492	Kurtosis Detects	1.674
Mean of Logged Detects	-1.465	SD of Logged Detects	1.485

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.81	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.226	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	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

KM Mean	0.126	KM Standard Error of Mean	0.0386
KM SD	0.344	95% KM (BCA) UCL	0.197
95% KM (t) UCL	0.19	95% KM (Percentile Bootstrap) UCL	0.191
95% KM (z) UCL	0.19	95% KM Bootstrap t UCL	0.215
90% KM Chebyshev UCL	0.242	95% KM Chebyshev UCL	0.294
97.5% KM Chebyshev UCL	0.367	99% KM Chebyshev UCL	0.51

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.242	Anderson-Darling GOF Test	
5% A-D Critical Value	0.779	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.127	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.206	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)	0.749	k star (bias corrected MLE)	0.666
Theta hat (MLE)	0.687	Theta star (bias corrected MLE)	0.772
nu hat (MLE)	28.46	nu star (bias corrected)	25.3
Mean (detects)	0.514		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.123
Maximum	2.1	Median	0.01
SD	0.345	CV	2.81
k hat (MLE)	0.369	k star (bias corrected MLE)	0.364
Theta hat (MLE)	0.332	Theta star (bias corrected MLE)	0.337
nu hat (MLE)	62.77	nu star (bias corrected)	61.89
Adjusted Level of Significance (β)	0.0472		
Approximate Chi Square Value (61.89, α)	44.8	Adjusted Chi Square Value (61.89, β)	44.55
95% Gamma Approximate UCL (use when n>=50)	0.17	95% Gamma Adjusted UCL (use when n<50)	0.17

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.126	SD (KM)	0.344
Variance (KM)	0.118	SE of Mean (KM)	0.0386
k hat (KM)	0.135	k star (KM)	0.138
nu hat (KM)	22.93	nu star (KM)	23.45
theta hat (KM)	0.936	theta star (KM)	0.915
80% gamma percentile (KM)	0.128	90% gamma percentile (KM)	0.369
95% gamma percentile (KM)	0.705	99% gamma percentile (KM)	1.699

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.45, α)	13.43	Adjusted Chi Square Value (23.45, β)	13.3
95% Gamma Approximate KM-UCL (use when n>=50)	0.22	95% Gamma Adjusted KM-UCL (use when n<50)	0.223

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.953	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.136	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	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	0.119	Mean in Log Scale	-4.728
SD in Original Scale	0.346	SD in Log Scale	2.048
95% t UCL (assumes normality of ROS data)	0.181	95% Percentile Bootstrap UCL	0.181
95% BCA Bootstrap UCL	0.196	95% Bootstrap t UCL	0.222
95% H-UCL (Log ROS)	0.155		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.287	KM Geo Mean	0.0137
KM SD (logged)	1.847	95% Critical H Value (KM-Log)	3.182
KM Standard Error of Mean (logged)	0.244	95% H-UCL (KM -Log)	0.144
KM SD (logged)	1.847	95% Critical H Value (KM-Log)	3.182
KM Standard Error of Mean (logged)	0.244		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.176	Mean in Log Scale	-2.976
SD in Original Scale	0.337	SD in Log Scale	1.706
95% t UCL (Assumes normality)	0.237	95% H-Stat UCL	0.383

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 Approximate Gamma UCL	**0.22**

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.

Heptachlor

General Statistics			
Total Number of Observations	85	Number of Distinct Observations	43
Number of Detects	4	Number of Non-Detects	81
Number of Distinct Detects	4	Number of Distinct Non-Detects	41
Minimum Detect	0.012	Minimum Non-Detect	0.002
Maximum Detect	0.42	Maximum Non-Detect	0.26
Variance Detects	0.0295	Percent Non-Detects	95.29%
Mean Detects	0.183	SD Detects	0.172
Median Detects	0.15	CV Detects	0.938
Skewness Detects	1.076	Kurtosis Detects	1.929
Mean of Logged Detects	-2.276	SD of Logged Detects	1.517

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.28	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	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			
KM Mean	0.0114	KM Standard Error of Mean	0.00652
KM SD	0.0509	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0223	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0222	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.031	95% KM Chebyshev UCL	0.0399
97.5% KM Chebyshev UCL	0.0522	99% KM Chebyshev UCL	0.0763

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.284	Anderson-Darling GOF Test	
5% A-D Critical Value	0.667	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.259	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.402	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	k star (bias corrected MLE)	0.417
Theta hat (MLE)	0.183	Theta star (bias corrected MLE)	0.439
nu hat (MLE)	7.998	nu star (bias corrected)	3.333
Mean (detects)	0.183		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.0181
Maximum	0.42	Median	0.01
SD	0.0491	CV	2.706
k hat (MLE)	1.167	k star (bias corrected MLE)	1.134
Theta hat (MLE)	0.0155	Theta star (bias corrected MLE)	0.016
nu hat (MLE)	198.4	nu star (bias corrected)	192.8
Adjusted Level of Significance (β)	0.0472		
Approximate Chi Square Value (192.77, α)	161.7	Adjusted Chi Square Value (192.77, β)	161.2
95% Gamma Approximate UCL (use when n>=50)	0.0216	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.0114	SD (KM)	0.0509
Variance (KM)	0.00259	SE of Mean (KM)	0.00652
k hat (KM)	0.0505	k star (KM)	0.0565
nu hat (KM)	8.582	nu star (KM)	9.613
theta hat (KM)	0.227	theta star (KM)	0.202
80% gamma percentile (KM)	0.00232	90% gamma percentile (KM)	0.0202
95% gamma percentile (KM)	0.0632	99% gamma percentile (KM)	0.237

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.61, α)	3.701	Adjusted Chi Square Value (9.61, β)	3.638
95% Gamma Approximate KM-UCL (use when n>=50)	0.0297	95% Gamma Adjusted KM-UCL (use when n<50)	0.0302

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.312	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	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	0.0089	Mean in Log Scale	-9.085
SD in Original Scale	0.0507	SD in Log Scale	2.258
95% t UCL (assumes normality of ROS data)	0.018	95% Percentile Bootstrap UCL	0.0187
95% BCA Bootstrap UCL	0.0266	95% Bootstrap t UCL	0.0346
95% H-UCL (Log ROS)	0.00361		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-5.96	KM Geo Mean	0.00258
KM SD (logged)	0.958	95% Critical H Value (KM-Log)	2.198
KM Standard Error of Mean (logged)	0.143	95% H-UCL (KM -Log)	0.00513
KM SD (logged)	0.958	95% Critical H Value (KM-Log)	2.198
KM Standard Error of Mean (logged)	0.143		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0424	Mean in Log Scale	-4.084
SD in Original Scale	0.0596	SD in Log Scale	1.528
95% t UCL (Assumes normality)	0.0532	95% H-Stat UCL	0.0862
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 **0.0223**

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.

Lead

General Statistics

Total Number of Observations	85	Number of Distinct Observations	80
		Number of Missing Observations	0
Minimum	14.9	**Mean**	**300.4**
Maximum	1350	Median	189
SD	312.1	Std. Error of Mean	33.85
Coefficient of Variation	1.039	Skewness	1.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.784	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.193	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0962	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	356.7	95% Adjusted-CLT UCL (Chen-1995)	362.2
		95% Modified-t UCL (Johnson-1978)	357.7

Gamma GOF Test

A-D Test Statistic	1.139	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.78	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0962	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0996	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.094	k star (bias corrected MLE)	1.064
Theta hat (MLE)	274.5	Theta star (bias corrected MLE)	282.5
nu hat (MLE)	186	nu star (bias corrected)	180.8
MLE Mean (bias corrected)	300.4	MLE Sd (bias corrected)	291.3
		Approximate Chi Square Value (0.05)	150.7
Adjusted Level of Significance	0.0472	Adjusted Chi Square Value	150.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	360.4	95% Adjusted Gamma UCL (use when n<50)	361.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.0899	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0637	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0962	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	2.701	Mean of logged Data	5.183
Maximum of Logged Data	7.208	SD of logged Data	1.071

Assuming Lognormal Distribution

95% H-UCL	413.8	90% Chebyshev (MVUE) UCL	445.7
95% Chebyshev (MVUE) UCL	505.9	97.5% Chebyshev (MVUE) UCL	589.4
99% Chebyshev (MVUE) UCL	753.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	356.1	95% Jackknife UCL	356.7
95% Standard Bootstrap UCL	355.5	95% Bootstrap-t UCL	365.7
95% Hall's Bootstrap UCL	360.9	95% Percentile Bootstrap UCL	356.3
95% BCA Bootstrap UCL	358.4		
90% Chebyshev(Mean, Sd) UCL	402	95% Chebyshev(Mean, Sd) UCL	448
97.5% Chebyshev(Mean, Sd) UCL	511.8	99% Chebyshev(Mean, Sd) UCL	637.2

Suggested UCL to Use
95% Approximate Gamma UCL 360.4

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

APPENDIX D

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

Appendix D Screening Level Ecological Risk Assessment

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List of Acronyms

Acronyms/ Abbreviations	Meaning
BCF	Bioconcentration Factor
CSM	Conceptual Site Model
COPC	Constituents of Potential Concern
DDT	Dichlorodiphenyltrichloroethane
EPC	Exposure Point Concentration
ESV	Ecological Screening Value
HI	Hazard Index
HQ	Hazard Quotient
kg	Kilogram
LOAEL	Lowest Observed Adverse Effects Level
mg/kg bw-day	Milligrams per kilogram of body weight per day
NOAEL	No Observed Adverse Effects Level
PCOPs	Preliminary Chemicals of Potential Concern
PRE	Preliminary Risk Evaluation
PRG	Preliminary Remedial Goal
RSV	Refinement Screening Value
SLERA	Screening Level Ecological Risk Assessment
TRV	Toxicity Reference Value
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency

D.1 Introduction

A screening level ecological risk assessment (SLERA), previously termed a preliminary risk evaluation (PRE), was initially conducted in 2007 as required under HSRA for the former Estech General Chemicals site (site) and the un-named stream to the east of the site on the CSX property. The results of the PRE were submitted in the Revised Compliance Status Report (MACTEC Engineering and Consulting, Inc., 2007). The PRE findings indicated the potential for unacceptable risk to ecological receptors from exposure to site surface soils. Exposure to the un-named stream did not present the potential for unacceptable risk to ecological receptors and additional study of the stream was not warranted. Additional ecological risk evaluation was not recommended for site surface soils because site remediation was anticipated to involve excavation, consolidation, and capping of impacted soils, which would have served to control or remove ecological exposures. The PRE results were submitted within the 2010 Voluntary Remediation Program Application for the Site (MACTEC Engineering and Consulting, Inc., 2010). The PRE was updated in 2011 in response to Georgia EPD comments on the VRP Application (MACTEC Engineering and Consulting, Inc., 2011). The updates did not change the overall conclusions of the PRE.

An updated SLERA is being submitted herein to quantify ecological exposures and address ecological risk for the site and nearby un-named stream. This updated SLERA is based on current conditions at the site and current regulatory guidance for risk assessment. The SLERA also addresses a Georgia EPD comment from 2010 on evaluating risk based on exposure domains applicable to the ecological receptors. Recent data collection at the site allows for characterization of the site based on current conditions and smaller exposure domains for the ecological receptors. The initial ecological risk evaluation was based on one exposure domain covering the entire 18 acres of the site and the adjacent CSX property and used historical data over ten years old. The updated SLERA will use more recent data and will be used to identify specific areas of the site driving risk that would require removal of soils or application of engineered exposure controls to comply with the remediation plans.

D.2 Screening Level Ecological Risk Assessment

This SLERA evaluates the potential environmental risks and/or effects associated with current site conditions and the un-named stream located on the adjacent CSX railroad property. The un-named stream located on the CSX railroad property is the discharge boundary for site groundwater. The SLERA identifies substances that might pose a hazard to ecological receptors, and evaluates the magnitude of potential adverse impacts to ecological receptors due to exposure to those substances. The methodology used in the SLERA is presented herein. The SLERA was conducted in accordance with USEPA's Region 4 Ecological Risk Assessment Supplemental Guidance (USEPA, 2018) and USEPA's Ecological Risk Assessment for Superfund: Process for Designing and Conducting Ecological Risk Assessment (ERAGS; USEPA, 1997). The SLERA consists of the following six steps:

1. Data Evaluation and COPC Selection (including identification of the risk assessment dataset and ecological screening value comparison)
2. Screening-level Problem Formulation
3. Screening-level Ecological Effects Assessment
4. Screening-level Ecological Exposure Estimate
5. Screening-level Ecological Risk Characterization
6. Identification of Uncertainties

In accordance with guidance requirements, the SLERA was designed to produce risk estimates that conservatively estimate risk. The media of concern to ecological receptors is surface soil at the site and sediment and surface water in the un-named stream located on the adjacent CSX property. Ecological receptors may contact these media directly and may be secondarily exposed to constituents through the food web (i.e., ingestion of biotic media that have accumulated constituents through direct contact with these media).

D.2.1 Data Evaluation and COPC Selection

The SLERA focused on evaluation of hazards and risks associated with previously identified four site-related metals (arsenic, copper, lead, and zinc) and thirteen pesticides.

D.2.1.1 Identification of PCOPCs

The first step of the SLERA is to select preliminary chemicals of potential concern (PCOPCs) in soil, sediment, and surface water that may affect ecological receptors by comparing the maximum detected concentration with USEPA's Region 4 media-specific ecological screening values (ESVs) (USEPA, 2018). USEPA Region 4 soil ESVs and sediment ESVs were used for soil and sediment screening, respectively. For surface water, the more conservative of the USEPA Region 4 chronic ESVs (USEPA, 2018) or the chronic Georgia Instream Water Quality Criteria (Georgia EPD 2015) were used as the surface water ESVs, per USEPA (2018) guidance. USEPA Region 4 has established ESVs based on contaminant levels associated with a low probability of unacceptable risks to ecological receptors. This approach assumes that the most sensitive receptors are those that live in direct contact with affected media and thus are exposed to contaminants through multiple pathways. Constituents with maximum detected concentrations exceeding the ESVs were selected as PCOPCs. If no PCOPCs are identified, no further evaluation is necessary.

PCOPCs were selected from the dataset in accordance with USEPA's Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft (USEPA, 2018). Per USEPA (2018) guidance, PCOPCs were selected using maximum screening hazard quotients (HQs). A maximum screening HQ was calculated using the maximum detected concentration or ½ the detection limit as a surrogate concentration (if the constituent was non-detect) of each constituent and comparing that value to the USEPA Region 4 soil ESV using the following formula:

$$Maximum\ Screening\ HQ\ = \frac{Maximum\ Detected\ Concentration\ (or\ surrogate\ concentration\ of\ {}^{1}/_{2}\ detection\ limit\ for\ non-detects)}{USEPA\ Region\ 4\ ESV}$$

USEPA (2018) guidance states that a screening HQ will determine if a constituent is a PCOPC and should be retained for further evaluation. A constituent was selected as a PCOPC if:

1. HQ ≥ 1. The maximum detected concentration was greater than or equal to the ESV.
2. The chemical was detected, but no ESV was available.
3. The chemical was not detected, but the surrogate concentration was greater than or equal to the ESV (HQ≥1).
4. The chemical was not detected, and no ESV was available.

Constituents were retained as PCOPCs if the screening HQs were equal to or greater than 1. A HQ equal to or greater than 1, the USEPA threshold value, indicates a potential for adverse effects. Those constituents without applicable screening values or appropriate surrogate screening values were retained as PCOPCs in the SLERA as a conservative measure. Furthermore, detected bioaccumulative constituents

that do not have a wildlife-based ESV were retained as PCOPCs, but on-detected bioaccumulative chemicals that do not have a wildlife-based ESV were not retained as PCOPCs, per USEPA (2018) guidance.Those constituents selected as PCOPCs based on the maximum screening were further evaluated in the refinement process of PCOPCs, per USEPA (2018) guidance (See Section 1.1.2).

Surface Soil

Surface soil samples (0 to 1 foot in depth) collected on the site in February 2018 were used for the surface soil dataset in this SLERA (refer to Attachment A-1 for the soil dataset; Figure D-1). Four site-related metals (arsenic, lead, copper, and zinc) and twelve pesticides were detected in the surface soil dataset. Methoxychlor was the only other analyzed pesticide not detected above reporting limits in surface soil. The maximum detected surface soil concentration, or if non-detect, a surrogate concentration based on the maximum detection limit, was compared to the USEPA Region 4 soil ESVs (USEPA, 2018) to generate a maximum screening HQ (Table D-1). Screening HQs equal to or greater than 1 yielded the following PCOPCs for surface soil:

Metals	
Arsenic	Lead
Copper	Zinc

Pesticides			
alpha-BHC	4,4'-DDD	Dieldrin	Heptachlor
beta-BHC	4,4'-DDE	alpha-Chlordane	Methoxychlor
gamma-BHC (lindane)	4,4'-DDT	gamma-Chlordane	Toxaphene
delta-BHC			

Sediment

Historical sediment samples (0 to 1 foot in depth) collected in 2000 and 2004 from the un-named stream on the CSX property were used for the sediment dataset in this SLERA (refer to Attachment A-2 for the sediment dataset; Figure D-1). Two site-related metals (arsenic and lead) and ten pesticides were detected in the sediment dataset. Methoxychlor and toxaphene were not detected above reporting limits in sediment. Toxaphene's reporting limit was above the sediment ESV. The maximum detected sediment concentration, or if non-detect, a surrogate concentration based on the maximum detection limit, was compared to the USEPA Region 4 sediment ESVs (USEPA, 2018) to generate a maximum screening HQ (Table D-2). Screening HQs equal to or greater than 1 yielded the following PCOPCs for sediment:

Metals	
Arsenic	Lead

Pesticides		
alpha-BHC	4,4'-DDD	Dieldrin
beta-BHC	4,4'-DDE	Chlordane
gamma-BHC (lindane)	4,4'-DDT	Heptachlor
delta-BHC		Toxaphene

Surface Water

Surface water samples collected semi-annually from 2016 through 2018 from the un-named stream on the CSX property were used for the surface water dataset in this SLERA (refer to Attachment A-3 for the surface water dataset; Figure D-1). Three site-related metals (arsenic, copper, and zinc) and four pesticides (alpha-BHC, beta-BHC, delta-BHC, and gamma-BHC [lindane]) were detected in the surface water dataset. The maximum detected surface water concentration, or if non-detect, a surrogate concentration based on half of the maximum detection limit (i.e., DDT and dieldrin), was compared to the more conservative of the USEPA Region 4 chronic ESVs (USEPA, 2018) or the chronic Georgia Instream Water Quality Criteria (Georgia EPD 2015) to generate a maximum screening HQ (Table D-3a). Hardness-dependent water quality criteria were calculated for three of the site–related metals using measured hardness data from the un-named stream (Table D-3b). Screening HQs equal to or greater than 1 yielded the following PCOPCs for surface water:

Metals	
Copper	Zinc

Pesticides	
alpha-BHC	4,4'-DDT
beta-BHC	Dieldrin
gamma-BHC (lindane)	
delta-BHC	

D.2.1.2 Refinement of PCOPCs

Those constituents selected as PCOPCs were further refined to identify chemicals of potential concern (COPCs) per the USEPA (2018) guidance. The goal of PCOPC refinement is to evaluate the conservative assumptions used in the selection of PCOPCs and determine if any of the PCOPCs would pose negligible risk if more realistic conservative assumptions were used. This helps to focus the SLERA on identifying a realistic list of COPCs that are more likely to pose risk to ecological receptors. Those constituents selected as COPCs based on the screening are then further evaluated in the SLERA using food web modeling to evaluate potential risk to ecological receptors per ERAGS (USEPA, 1997).

USEPA (2018) guidance provides refinement screening values (RSVs) for comparison to the 95 percent upper confidence limit of the arithmetic mean (95% UCL) as the exposure point concentration (EPC), instead of the maximum concentration. The 95% UCL concentrations were calculated using ProUCL 5.1 (USEPA, 2015). The soil RSVs used were the lower of the avian and mammalian ESVs provided in USEPA (2018) guidance as these receptors are the receptors of interest for the SLERA. The sediment RSVs are from the USEPA (2018) guidance. For surface water, ESVs were used as the RSVs because the values are primarily based on State water quality standards so exposure durations relevant to the numerical standard apply.

Constituents with 95% UCL concentrations exceeding the RSVs were selected as COPCs. Per USEPA (2018) guidance, COPCs were selected using 95% UCL HQs. A 95% UCL HQ was calculated by dividing the 95% UCL concentration of each constituent by the RSV. COPCs were retained if the 95% UCL HQs were equal to or greater than 1. Constituents frequently detected, bioaccumulative, and with no RSV available were

carried forward into food web modeling. Non-detect constituents were not carried forward into food web modeling. A qualitative evaluation of those constituents is provided below.

Surface Soil

Table D-4 presents the results of the refinement screening for surface soil. The four site-related metals and six pesticides were retained as COPCs in surface soil based on the 95% UCL HQs. Methoxychlor was the only non-detect pesticide in surface soil with elevated reporting limits above the ESV and RSV (Table D-1). Methoxychlor was not retained as a COPC. The SLERA focuses on the other pesticides detected in site surface soil with consideration that potential corrective action addressing other COPCs with unacceptable risk would also address methoxychlor.

Sediment

Table D-5 presents the results of the refinement screening for sediment. One site-related metal (arsenic) and nine pesticides were retained as COPCs in sediment based on the 95% UCL HQs. Toxaphene was non-detect in sediment with elevated reporting limits above the ESV and RSV (Table D-2). Toxaphene was not retained as a COPC in sediment, and it was screened out as a PCOPC in surface water. The SLERA focuses on the other pesticides detected in sediment with consideration that potential corrective action addressing other COPCs with unacceptable risk would also address toxaphene.

Surface Water

Table D-6 presents the results of the refinement screening for surface water. Two site-related metals (copper and zinc) and four pesticides were retained as COPCs in surface water based on the 95% UCL HQs. 4,4-DDT and dieldrin were non-detect in surface water with elevated reporting limits above the ESV (Table D-3). 4,4-DDT and dieldrin were not retained as COPCs in surface water. The SLERA focuses on the other four pesticides detected in surface water with consideration that potential corrective action addressing other COPCs with unacceptable risk would also address 4,4-DDT and dieldrin.

D.2.1.3 Selection of COPCs

The following constituents were retained as COPCs:

	Soil COPCs	Sediment COPCs	Surface Water COPCs
Metals	Arsenic Copper Lead Zinc	Arsenic	Copper Zinc
Pesticides	beta-BHC gamma-BHC (lindane) 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin	alpha-BHC beta-BHC gamma-BHC (lindane) delta-BHC 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin Chlordane	alpha-BHC beta-BHC gamma-BHC (lindane) delta-BHC

D.2.2 Screening-Level Problem Formulation

The screening-level problem formulation identifies ecological receptors that may be affected by COPCs at the site or in the un-named stream on the CSX property. Potential pathways of exposure, assessment endpoints, and surrogate species representative of ecological receptors were selected for evaluation in the screening-level risk characterization.

D.2.2.1 Environmental Setting

The Site is located in the Piedmont Physiographic province of north central Georgia. The site is densely vegetated. Dominant land use characteristics observed within a 0.5-mile radius of the site include railroad facilities (CSX Transportation and Norfolk Southern Railway) in the immediate vicinity of the site and heavy commercial use surrounding the area. The site has rolling topography and slopes from the southwest to the northeast. The low portion of the site is along the eastern boundary. Railroad tracks, which entirely surround the site, have been reported to prevent the flow of surface water from the site (NUS, 1988). The site supports terrestrial and semi-aquatic wildlife.

D.2.2.2 Fate and Transport Mechanisms

During problem formation, pathways for migration of a contaminant are considered for the development of a conceptual site model (USEPA, 1997). COPCs have been detected in soils and groundwater on the site at elevated concentrations. Groundwater from the site is considered to discharge to the surface water in the un-named stream, creating a potential pathway for dissolved constituent migration to surface water. Surface runoff may also contribute surface soil constituents to surface water. The ecological conceptual site model (CSM) is presented as Figure D-3. The CSM identifies potential exposure pathways, including known and/or suspected sources of contamination, release mechanisms, contaminated media, exposure routes, and receptors. The CSM includes terrestrial and avian receptors and is based on the food web model. Potentially contaminated media of ecological significance at the site include surface soil, surface water, and sediment. Ecological receptors may be exposed to contaminants directly by ingestion or absorption of these media or indirectly through the food web.

D.2.2.3 Exposure Pathways

The identification of exposure pathways is necessary for the completion of the conceptual model for a Site (USEPA, 1997b). Due to diverse life cycle characteristics, wildlife exposure to metals and pesticides at the site is species-dependent. Birds and reptiles that live in and/or forage in the stream may be exposed to constituents via direct contact and the food web. Aquatic organisms, such as fish, aquatic invertebrates, and aquatic vegetation, are more exposed to contaminants in the water column or that move through the food web than contaminants in the sediments. However, the un-named stream is located adjacent to two concrete plants with drain pipes that flow into the stream. These drains feed concrete residues from the plants and the characteristic powder has coated the bottom of the streambed and associated benthic habitat. Thus, no significant aquatic life resides in the un-named stream and aquatic life was not further addressed in this SLERA. However, terrestrial and semi-aquatic wildlife which might drink from the stream or wash food in the stream (i.e., raccoons) were quantified.

The exposure media considered for the site and un-named stream are surface soil, sediment, and/or surface water. The un-named stream located on the CSX railroad property is considered the discharge boundary for site groundwater. Groundwater discharge to surface water is assessed in the SLERA in surface water exposures. The SLERA focuses on potential exposures of terrestrial and semi-aquatic wildlife.

Terrestrial and semi-aquatic wildlife that reside and/or forage at the site and un-named stream may be exposed to constituents detected in soil, sediment, and/or surface water via direct contact (i.e., incidental ingestion or uptake through the skin) and/or through the food web. The various wildlife trophic levels present at the site are illustrated by the food web model in Figure D-4.

D.2.2.4 Assessment Endpoints

Assessment endpoints identify the overarching ecological values in need of protection (USEPA, 1997b). The assessment endpoints identified for the SLERA are intended to encompass the receptors most likely to be impacted by COPCs. Therefore, the specific assessment endpoints identified for this SLERA are:

1. Survival and reproduction of terrestrial birds that are exposed to site surface soil and surface water in the un-named stream through direct contact, incidental ingestion, and the food web
2. Survival and reproduction of terrestrial birds that are exposed to water (only) in the un-named stream through direct contact, incidental ingestion, and the food web
3. Survival and reproduction of mammals that are exposed to site surface soil and surface water/sediments in the un-named stream through direct contact, incidental ingestion, and the food web
4. Survival and reproduction of mammals that are exposed to surface water and sediments (only) in the un-named stream through direct contact, incidental ingestion, and the food web

The receptors used to represent surrogate species for assessment endpoints 1 and 2 are the northern bobwhite and, for assessment endpoints 3 and 4, are the short-tailed shrew and the raccoon. These wildlife species favor habitats consistent with conditions of the site and may potentially be found in the area. The northern bobwhite is representative of gallinaceous birds which have been observed to forage at the site. The northern bobwhite was selected as the surrogate species because it is a species known to be present at the site. The short-tailed shrew was selected as a lower trophic level surrogate species because it is a small carnivorous mammal which may forage and nest at the site. The raccoon was selected as a higher trophic level surrogate species because it is an omnivorous species known to be present at the site and known to wash its food in streams similar to the un-named stream. The life history and behavior of these species ensure a conservative estimate of risk per USEPA (1997) guidance. Exposure assumptions for each receptor are presented in Table D-7. The measurement endpoints developed using this set of surrogate receptors were daily dietary intake concentrations (representative of No Observed Adverse Effects Level [NOAEL] and Lowest Observed Adverse Effects Level [LOAEL] for survival, reproduction, and/or growth).

D.2.3 Screening-Level Ecological Effects Evaluation

The screening-level ecological effects evaluation identifies the toxicity values for use in risk calculations to estimate potential risks to ecological receptors. Toxicity reference values (TRVs) are identified as toxicological benchmarks for laboratory test species, which have been extrapolated to represent surrogate receptor species. Chronic NOAELs are the preferred toxicity values used in the SLERA. LOAEL TRVs are also included in the SLERA as an additional line of evidence when further evaluation is necessary. The TRVs for the SLERA were primarily based on USEPA (2018) guidance, citing the primary source for each value. The TRVs are based on survival, reproduction, and/or growth for mammalian and avian species.

TRVs for the receptor species are presented in Table D-8 for mammalian species and Table D-9 for avian species. These TRVs were used in the estimation of risk to receptor species arising from potential exposure to COPCs in abiotic and biotic media at the site and un-named stream.

D.2.4 Screening-Level Ecological Exposure Estimate

The screening-level ecological exposure estimate evaluates the potential pathways of exposure appropriate to the assessment endpoints and ecological receptors at the site and un-named stream. In the screening-level ecological exposure estimate, exposure assumptions are summarized to present the conservative parameters used for each surrogate species in the food web model.

Exposure assumptions for the surrogate species are identified for use in the food web model calculations to estimate risk. Typically, a SLERA is performed using conservative assumptions for exposure to COPCs (USEPA, 1997). Thus, a site foraging factor and exposure frequency are set to 1, assuming that the receptor spends its entire life and obtains 100 percent of its diet at the site. The SLERA also assumes that bioavailability of COPCs is 100 percent. Body weights, dietary compositions, water ingestion rates, and foraging ranges were based on USEPA (2018) guidance and USEPA's Wildlife Exposure Factors Handbook (1993). The food ingestion rates (on a wet weight basis) and the soil/sediment ingestion rates (on a dry weight basis) were obtained from Nagy's Food Requirements of Wild Animals: Predictive Equations for Free-living Mammals, Reptiles, and Birds (2001). These exposure assumptions are summarized in Table D-7.

Bioconcentration factors (BCFs) were used to estimate tissue concentrations for plants, soil invertebrates, birds, and small mammals. BCFs were primarily obtained from USEPA's Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (1999). Plant BCFs were not available for most of the pesticides for vegetation. Therefore, plant BCFs were calculated using the following regression equation:

> Log BCF = 1.588 – 0.578 x log Kow (Travis and Arms, 1988), where Kow is the octanol-water partitioning coefficient

Prey item EPCs were calculated on a wet weight basis. Plant BCFs were converted to wet weight using typical percentage of solids in vegetative tissue obtained from scientific literature (USEPA, 1993). Table D-10 presents the BCFs used for plants, soil invertebrates, birds, and small mammals.

Surface water metal EPCs were converted from dissolved concentrations to total concentrations for use in the food web modeling risk estimates because ecological receptors are exposed to total concentrations. Refer to Attachment B for the conversion calculations.

Ecological exposure was evaluated using two different scenarios, depending on the receptor: 1) exposure to site surface soil and surface water and/or sediment from the un-named stream; and 2) exposure to surface water from the un-named stream and/or site surface soil. Exposure areas used for the food web modeling were based on the home ranges of the ecological receptor. The shrew's home range of one acre was used as the exposure unit for the shrew with a total of 18 exposure units evaluated at the site. Due to the larger home ranges for the raccoon and northern bobwhite, exposure was evaluated on a site-wide basis for these two receptors. In addition, exposure for the raccoon included soil and sediment incidental ingestion for scenario 1 above with 50 percent of the exposure allocated to soil and 50 percent to sediment. Table D-11 presents the soil exposure unit EPCs for the shrew, which includes the maximum detected and 95% UCL concentrations. Table D-12 presents the site wide soil, sediment, and surface water EPCs for each receptor, which include the maximum detected and 95% UCL concentrations. Attachment C presents the ProUCL inputs and outputs for the 95% UCL surface soil concentrations for the shrew by exposure unit. Site-wide soil, sediment, and surface water ProUCL inputs and outputs are presented in Attachment A. For non-detect constituents in abiotic media that require an EPC for food web modeling, the maximum reporting limit and one-half the maximum reporting limit are provided in the tables.

D.2.5 Screening-Level Ecological Risk Characterization

The screening-level ecological risk characterization integrates the results of the screening-level ecological exposure estimation and screening-level ecological effects evaluation to determine the potential risk to ecological receptors arising from potential exposure to COPCs detected at the site and un-named stream. The screening-level ecological risk calculations for wildlife were performed using the HQ method that compares exposure concentrations (e.g., maximum detected concentrations in soil) and estimated exposure levels to the analyte-specific TRVs (i.e., NOAEL). The HQ method compares the estimated exposure levels to the toxicity reference value and is expressed as:

HQ = Intake/TRV

Where: Intake = daily intake (ingestion) (milligrams per kilogram body weight per day [mg/kg bw-day])
TRV = toxicity reference value (mg/kg bw-day)

A HQ value equal to or below 1.0 is considered unlikely to cause adverse ecological effects. A HQ value greater than 1.0 generally indicates a potential for adverse ecological effects. The HQs calculated for individual constituents for each receptor were added to generate a hazard index (HI). The summation of the HQs yields a conservative estimate used to indicate whether multiple constituents at a site might pose a potential risk even when an individual COPC may not. A HQ or HI greater than 1.0 generally indicates a potential for adverse effects. In choosing to add HQs for individual COPCs, it is assumed that the effects of the individual chemicals are additive. The following subsections discuss the risk estimates. Tables D-13 through D-15 present the NOAEL risk estimates based on maximum EPCs presented on Tables D-11 and D-12. Table D-19 presents a summary of the NOAEL risk estimates.

D.2.5.1 Screening-Level Ecological Risk Characterization - NOAEL Analysis

The NOAEL HQs and HIs for the representative receptors are summarized below.

Short-tailed Shrew

Table D-13a provides the risk calculations for the short-tailed shrew exposed to site surface soils and surface water from the un-named stream, and Table D-13b presents potential risks for the short-tailed shrew exposed to the un-named stream only. NOAEL HIs for the short-tailed shrew from exposure to COPCs detected in surface soil and surface water ranged from 11 (exposure unit S14) to 4,100 (exposure unit S09) across the site. HQs were above 1 for the four site-related metals and eight pesticides. Risk drivers across the site were primarily lead, 4,4-DDT, and dieldrin. The NOAEL HI for the short-tailed shrew exposed to surface water only from the un-named stream is 0.098. Thus, there is the potential for unacceptable risk for the short-tailed shrew across the site associated with surface soil exposure. Surface water exposure to COPCs in the un-named stream does not pose unacceptable risk to small terrestrial mammals.

Raccoon

Table D-14a provides the risk calculations for the raccoon exposed to site surface soils and surface water and sediments from the un-named stream, and Table D-14b presents potential risks for the raccoon exposed to surface water and sediments from the un-named stream only. The NOAEL HI for the raccoon from exposure to COPCs detected in surface soil, surface water, and sediment was 855. HQs were above 1 for the four site-related metals and five pesticides. Risk drivers were lead, 4,4-DDT, and dieldrin. The

NOAEL HI for the raccoon exposed to surface water and sediment only from the un-named stream is 0.22. Thus, there is the potential for unacceptable risk for the raccoon associated with surface soil exposure. Surface water and sediment exposure to COPCs in the un-named stream do not pose unacceptable risk to semi-aquatic omnivorous mammals.

Northern Bobwhite

Table D-15a provides the risk calculations for the northern bobwhite exposed to site surface soils and surface water from the un-named stream, and Table D-15b presents potential risks for the northern bobwhite exposed to the un-named stream only. The NOAEL HI for the northern bobwhite from exposure to COPCs detected in surface soil and surface water was 1,100. HQs were above 1 for the four site-related metals and five pesticides. Risk drivers were lead, 4,4-DDT, and dieldrin. The NOAEL HI for the northern bobwhite exposed to surface water only from the un-named stream is 0.0085. Thus, there is the potential for unacceptable risk for the northern bobwhite associated with surface soil exposure. Surface water exposure to COPCs in the un-named stream does not pose unacceptable risk to terrestrial birds.

D.2.5.2 Refined Ecological Risk Characterization - LOAEL Analysis

HQs based on LOAEL TRVs can be calculated as additional lines of evidence for the risk manager when further evaluation is necessary based on NOAEL-based TRVs in the SLERA. Thus, LOAEL HQs and HIs were calculated to provide additional information to risk managers for determining whether there will be unacceptable risk once a site specific evaluation is performed. In this case, the addition of the LOAEL risk characterization is beneficial to the risk managers' decision as to whether further action or a more formal ERA should be considered. The LOAEL risk characterization was included to evaluate a more realistic scenario using site home ranges for the receptors evaluated. The short-tailed shrew was quantified on a one acre basis while the raccoon and the bob-white quail were quantified on a site wide basis due to larger home ranges for these receptors.

The LOAEL HQs/HIs were calculated using LOAEL TRVs and the 95% UCL concentrations (calculated using ProUCL 5.1.002; USEPA, 2015) as the EPCs for each COPC with a NOAEL HQ ≥1, where applicable. The 95% UCL concentrations used in the LOAEL risk estimates are presented on Tables D-11 and D-12. Tables D-16 through D-18 present the LOAEL risk estimates. Table D-19 presents a summary of the LOAEL risk estimates.

The resultant LOAEL HQs and HIs for the representative receptors are summarized below.

Short-tailed shrew

Table D-16 provides the risk calculations for the short-tailed shrew exposed to site surface soils and surface water from the un-named stream. LOAEL HIs for the short-tailed shrew from exposure to COPCs detected in surface soil and surface water ranged from 0.78 (exposure unit S14) to 127 (exposure unit S09) across the site. HQs were above 1 for the three site-related metals and five pesticides. Primary risk drivers included arsenic (exposure units S01, S02, S04, S06, S12, and S15), beta-BHC (exposure units S02 and S07), 4,4-DDT (exposure units S02, S07, S09, S11, S13, and S18), dieldrin (exposure units S07 and S16), lead (exposure units S03, S15, and S16), and zinc (exposure units S06 and S08). Thus, there is the potential for unacceptable risk for the short-tailed shrew associated with surface soil exposure.

Raccoon

Table D-17 provides the risk calculations for the raccoon exposed to site-wide surface soils and surface water and sediments from the un-named stream. The LOAEL HI for the raccoon from exposure to COPCs

detected in surface soil, surface water, and sediment was 1.3. None of COPC HQs were above a HQ of 1; however, the risk drivers were 4,4-DDT (HQ of 0.74) and arsenic (HQ of 0.26) which was primarily driven by surface soil exposure. Thus, potential site-wide surface soil exposure poses a low to borderline level of risk to raccoons.

Northern Bobwhite

Table D-18 provides the risk calculations for the northern bobwhite exposed to site-wide surface soils and surface water from the un-named stream. The LOAEL HI for the northern bobwhite from exposure to COPCs detected in surface soil and surface water was 5.4. The primary risk drivers were lead (HQ of 2.9), 4,4-DDT (HQ of 1.3), and arsenic (HQ of 0.51). Thus, there is the potential for unacceptable risk for the northern bobwhite associated with site-wide surface soil exposure.

D.2.5.3 Risk Summary

NOAEL and LOAEL HIs were above 1 for the three receptors evaluated due to surface soil exposure. NOAEL risk drivers included the four site-related metals and eight pesticides. Primary LOAEL risk drivers for the shrew included arsenic, beta-BHC, 4,4-DDT, dieldrin, lead, and zinc based on 1-acre soil exposure units. LOAEL risk drivers for the raccoon and bobwhite included arsenic, lead, and 4,4-DDT based on site-wide soil exposure but only DDT exceeded an HQ of 1 and the others were only near on HQ of 1 which contributed to additive risk. There is the potential for unacceptable risk for terrestrial mammals, terrestrial birds, and semi-aquatic mammals exposed to site surface soil. Surface water and/or sediment exposure to COPCs in the un-named stream do not pose unacceptable risk to ecological receptors. Further evaluation of ecological exposure to the un-named steam is not warranted. However, based on the NOAEL and LOAEL HIs for site surface soil exposure, calculation of preliminary remedial goals (PRGs) for site surface soils are necessary.

D.2.6 Identification of Uncertainties

The SLERA is designed to be conservative to assure that no constituents that might adversely impact ecological receptors will be eliminated in the screening analysis. The screening values used in this SLERA are designated to be conservative and screen out only those substances for which there is little probability of posing a hazard to ecological receptors. Therefore, HQs and HIs for constituents below 1 indicate no unacceptable risk to the ecological receptors. However, because of the conservatism built into the derivation of TRVs and exposure estimates, HQs above 1 do not necessarily mean that ecological receptors are at risk of ecologically significant population level adverse effects. Key uncertainties associated with this SLERA that may have the most impact on the results of the SLERA are the following:

- ***Sediment data included in SLERA*** – Sediment data collected in 2000 and 2004 were available for use in the SLERA. Use of historical sediment data to estimate exposure under current conditions may result in either overestimation or underestimation of risk.
- ***Non-detect constituents*** – EPCs used for non-detect COPCs were the maximum reporting limit in NOAEL-based risk calculations and one-half the maximum reporting limit for LOAEL-based risk calculations. Use of these values for non-detect COPCs may overestimate risk for those COPCs.
- ***Intraspecies extrapolation*** – Species differ with respect to absorption, metabolism, distribution, and excretion of constituents. The body weight scaling used to extrapolate between species assumes that an organism's ability to metabolize COPCs is inversely related to body size. The need to extrapolate between species may result in either overestimation or underestimation of risk.

- ***Use of a NOAEL as the toxicological benchmark*** – The NOAEL is used as the toxicological benchmark in the SLERA and is expected to result in an overestimation of risk.
- ***Ecotoxicity data used for TRV calculation*** – Toxicity data used to calculate a TRV consisted of available NOAELs and LOAELs reported in literature and are not site-specific. The use of these values is expected to have the potential to result in an underestimate or overestimation of risk.
- ***Exposure assumptions*** – In the SLERA, a site foraging factor and exposure frequency are set to 1, assuming that the receptor spends its entire life at the site and obtains 100 percent of its diet at the site. The SLERA also assumes that bioavailability of COPCs is 100 percent. These conservative assumptions may overestimate risk.
- ***Use of maximum concentration*** – Maximum detected concentrations were used in the ingestion calculations with NOAEL TRVs. The use of maximum detected concentrations is expected to result in an overestimation of risk.
- ***Calculations of constituent concentrations in biotic media*** – Bioconcentration factors from scientific literature were used to derive plant, soil invertebrate, bird, and small mammal tissue concentrations for COPCs. The use of empirical data from controlled laboratory tests may underestimate or overestimate risk. Surrogate BCFs were used for those constituents without available data. Use of surrogate BCFs may underestimate or overestimate risk.
- ***Additive HI calculation*** - The HIs were calculated by adding chemical-specific HQs, assuming the additive effect of the individual chemicals. Metals and pesticides have distinct modes of toxicity and effects endpoints; therefore, an assumption of additive effects may overestimate the total risk to mammals and birds.

D.2.7 SLERA Conclusions

This SLERA evaluates the potential environmental risks and/or effects associated with current site conditions and the un-named stream located on the adjacent CSX railroad property. The un-named stream located on the CSX railroad property is the discharge boundary for site groundwater. The SLERA identifies substances that might pose a hazard to ecological receptors, and evaluates the magnitude of potential adverse impacts to ecological receptors due to exposure to those substances. The SLERA focused on evaluation of hazards and risks associated with previously identified four site-related metals (arsenic, copper, lead, and zinc) and thirteen pesticides from the PRE.

Ecological exposure was evaluated using two different scenarios, depending on the receptor: 1) exposure to site surface soil and surface water and/or sediment from the un-named stream; and 2) exposure to surface water from the un-named stream and/or site surface soil. In addition, exposure areas used for the food web modeling were based on the home ranges of the ecological receptor. The shrew's home range of one acre was used as the exposure unit for the shrew with a total of 18 exposure units evaluated at the site. Due to the larger home ranges for the raccoon and northern bobwhite, exposure was evaluated on a site-wide basis for these two receptors. NOAEL and LOAEL HIs were above 1 for the short-tailed shrew, raccoon, and northern bobwhite due to surface soil exposure. NOAEL risk drivers included the four site-related metals and eight pesticides. Primary LOAEL risk drivers for the shrew included arsenic, beta-BHC, 4,4-DDT, dieldrin, lead, and zinc based on 1-acre soil exposure units. LOAEL risk drivers for the raccoon and bobwhite included arsenic, lead, and 4,4-DDT based on site-wide soil exposure; however, only DDT exceeded an HQ of 1 for these two receptors. There is the potential for unacceptable risk for terrestrial mammals, terrestrial birds, and semi-aquatic mammals exposed to site surface soil. Surface water and/or sediment exposure to COPCs in the un-named stream do not pose unacceptable risk for ecological receptors. Further evaluation of ecological exposure to the un-named steam is not warranted. However,

based on the NOAEL and LOAEL HIs for site surface soil exposure, calculation of preliminary remedial goals (PRGs) for site surface soils are necessary.

D.3 Preliminary Remedial Goal Development

Ecological risk-based PRGs for surface soil were developed for the site to facilitate planning of corrective actions. The ecological PRGs were calculated to represent acceptable exposure-point concentration estimates for representative ecological receptors to each COPC with LOAEL-based unacceptable risk identified in the SLERA. PRGs for the protection of wildlife were compiled from the food web modeling by back-calculating to obtain the surface soil concentrations representing a HQ of 1 for the NOAEL and LOAEL TRVS for those COPCs posing unacceptable risk, per USEPA Region 4 guidance (USEPA, 2018). PRGs were calculated for those COPCs with LOAEL-based HQs above 1 and for those COPCs that are primary contributors to an overall LOAEL-based HI above 1.

Table D-20 presents the surface soil PRG calculations for the short-tailed shrew, raccoon, and northern bobwhite. Surface soil PRGS were calculated for 1-acre soil exposure units based on the shrew and for site-wide soil exposure based on the raccoon and northern bobwhite.

Ecological PRGs based on 1-acre surface soil exposure units for the shrew were developed for three site-related metals (arsenic, lead, and zinc) and five pesticides (beta-BHC, 4,4-DDD, 4,4-DDE, 4,4-DDT, and dieldrin). The 1-acre soil exposure unit NOAEL- to LOAEL-based PRG range for the shrew are as follows:

- Arsenic – 32 to 139 mg/kg
- Lead – 334 to 5,692 mg/kg
- Zinc – 548 to 2,170 mg/kg
- beta-BHC – 1.2 to 5.9 mg/kg
- DDT and metabolites – 0.49 to 15 mg/kg
- Dieldrin – 0.045 to 3.8 mg/kg

Ecological PRGs based on site-wide surface soil exposure for the raccoon and northern bobwhite were developed for arsenic, lead, and 4,4-DDT. The raccoon only showed risk for arsenic and DDT. The northern bobwhite PRGs were the lower of the two site-wide receptors (presented below). The site-wide soil NOAEL- to LOAEL-based PRG range protective of both the raccoon and the Northern bobwhite are as follows:

- Arsenic – 159 to 319 mg/kg
- Lead – 152 to 1,051 mg/kg
- DDT – 3.1 to 48 mg/kg

Comparison of site soil concentrations to the LOAEL PRGs would require corrective action to be protective of ecological receptors. Sampling points associated with higher concentrations of ecological COPCs were contributing to the majority of the potential ecological risks. This step was accomplished by sorting the site-wide soil data set from low to high concentrations. The high concentrations were systematically removed and UCLs were recalculated repeatedly until the UCL was less than the LOAEL PRG (see Attachment D-1).

Systematic removal of higher concentrations on a 1-acre soil exposure unit basis is confounded by the number of samples located in each given exposure unit (average of 8 sampling points per exposure unit). Potential reductions in sample size may not provide a representative UCL concentration for the exposure

unit. Determination of site soils requiring corrective action based on 1-acre soil exposure units for the shrew was achieved by identifying sampling points with one or more COPC concentrations exceeding respective COPC LOAEL PRGs. Identified sampling points were excluded from subsequent UCL calculations to confirm that the estimated post corrective action soil EPCs were less than respective COPC LOAEL PRGs (see Attachment D-2).

No corrective action is needed regarding site-wide surface soil COPC exposures for the raccoon. Current site-wide surface soil arsenic and DDT EPCs are below respective LOAEL PRGs (see Tables D-12 and D-20).

Corrective action to address site-wide exposure to COPCs for the Northern bobwhite is needed to reduce site-wide surface soil UCL concentrations for lead and 4,4'-DDT below the site-wide LOAEL PRGs as illustrated in Figure D-5.

- Lead-related corrective action is needed for 15 sampling points to achieve a site-wide surface soil lead UCL below the respective LOAEL PRG.
- DDT-related corrective action is needed for only one sampling point (C20) to achieve a site-wide surface soil DDT UCL below the respective LOAEL PRG.

Corrective action to address 1-acre surface soil exposure units for the short-tailed shrew is needed to reduce surface soil UCL concentrations for several metals and pesticides to concentrations below the 1-acre soil exposure unit LOAEL PRGs as illustrated in Figure D-6.

- Arsenic-related corrective action is needed for 34 sampling points across 10 exposure units.
- Lead-related corrective action is needed for 11 sampling points across 7 exposure units.
- Zinc-related corrective action is needed for 5 sampling points across 4 exposure units.
- Beta-BHC-related corrective action is needed for 3 sampling points across 3 exposure units.
- DDT-related corrective action is needed for 13 sampling points across 9 exposure units.
- DDD-related corrective action is needed for 2 sampling points across 2 exposure units.
- DDE-related corrective action is needed for 1 sampling point in 1 exposure unit.
- Dieldrin-related corrective action is needed for 8 sampling points across 6 exposure units.
- Corrective action for exposure units S07, S08, and S13 are limited to one sampling point per exposure unit (D17, E15, and E25; respectively).
- Exposure units S05, S10, S14, and S17 do not require corrective action.

A summary of the estimated post corrective action soil EPCs based on 1-acre surface soil exposure units for the shrew and site-wide exposure for the Northern bobwhite is provided in Table D-21.

If corrective action is undertaken for human health related risk (See Appendix C), then the corrective action footprint would address site-wide risk for the Northern bobwhite If corrective action is undertaken for human health related risk and expanded to include six additional sampling points (A22, B23, C25, C28, E15, and F31), then the footprint would address site-related risk for the short-tailed shrew and Northern bobwhite (See Figures D-5, D-6, and Appendix C Figure HH-2).

D.4 References

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Tables

Table D-1
Selection of Ecological Preliminary Chemicals of Potential Concern (PCOPCs) in Surface Soil
Former Estech Chemicals Site
Atlanta, GA

Constituent	Frequency of Detection [(a)]	Minimum Detected Concentration [(a)]	Maximum Detected Concentration [(a)] (MDC)	Location of MDC	Range of Reporting Limits [(b)]	EPA Region 4 Soil ESVs[(c)]	Max. Hazard Quotient (HQ) [(d)]	Number of Detected Concentrations Exceeding ESV [(e)]	Number of Concentrations Exceeding ESV [(f)]	Ecological PCOPC? (Y/N)	Basis for PCOPC Selection
METALS (mg/kg)											
Arsenic	**115 / 144**	**7.67**	**2,430**	**F3**	**7.14 - 11.6**	**18**	**135**	**88**	**88**	**Y**	**(1)**
Copper	**144 / 144**	**5.77**	**2,360**	**E11**	**NA - NA**	**28**	**84**	**121**	**121**	**Y**	**(1)**
Lead	**144 / 144**	**14.9**	**78,400**	**E27**	**NA - NA**	**11**	**7127**	**144**	**144**	**Y**	**(1)**
Zinc	**142 / 144**	**32.7**	**4,730**	**E11**	**96.5 - 111**	**46**	**103**	**139**	**141**	**Y**	**(1)**
PESTICIDES (mg/kg)											
alpha-BHC	**14 / 144**	**0.022**	**1.1**	**F4**	**0.0020 - 4.9**	**0.0003**	**3667**	**14**	**144**	**Y**	**(1)**
beta-BHC	**48 / 144**	**0.0037**	**99**	**F4**	**0.0021 - 2.3**	**0.0003**	**330000**	**48**	**144**	**Y**	**(1)**
alpha-Chlordane	**27 / 144**	**0.0055**	**23**	**C20**	**0.0021 - 2.3**	**0.0029**	**7931**	**27**	**138**	**Y**	**(1)**
gamma-Chlordane	**37 / 144**	**0.016**	**69**	**C20**	**0.0021 - 2.3**	**0.02**	**3450**	**35**	**114**	**Y**	**(1)**
4,4'-DDD	**36 / 144**	**0.051**	**27**	**C20**	**0.0041 - 7.6**	**0.021 (g)**	**1286**	**36**	**127**	**Y**	**(1)**
4,4'-DDE	**102 / 144**	**0.0074**	**25**	**C20**	**0.0041 - 7.6**	**0.021 (g)**	**1190**	**100**	**133**	**Y**	**(1)**
4,4'-DDT	**117 / 144**	**0.012**	**1600**	**C20**	**0.0041 - 43**	**0.021 (g)**	**76190**	**114**	**133**	**Y**	**(1)**
delta-BHC	**5 / 144**	**0.024**	**1.90**	**F4**	**0.0020 - 4.9**	**NA**	**NA**	**NA**	**NA**	**Y**	**(2)**
Dieldrin	**43 / 144**	**0.016**	**29**	**C20**	**0.0041 - 4.5**	**0.0029**	**10000**	**43**	**144**	**Y**	**(1)**
gamma-BHC (lindane)	**9 / 144**	**0.031**	**0.99**	**F4**	**0.0020 - 4.9**	**0.0031**	**319**	**9**	**136**	**Y**	**(1)**
Heptachlor	**10 / 144**	**0.012**	**41**	**C20**	**0.0020 - 2.3**	**0.0016**	**25625**	**10**	**144**	**Y**	**(1)**
Methoxychlor	**0 / 144**	**--**	**--**	**A22**	**0.0200 - 230**	**0.0021**	**54762 (h)**	**0**	**144**	**Y**	**(3)**
Toxaphene	**15 / 144**	**0.25**	**21.00**	**C4**	**0.210 - 2,100**	**0.00015**	**140000**	**15**	**144**	**Y**	**(1)**

Notes:
(a) Includes soil samples (0' to 1') collected in 2018.
(b) Range of reporting limits for non-detect samples.
(c) USEPA Region 4 ERA Supplemental Guidance; Table 3 Soil Ecological Screening Values (ESVs) [USEPA, 2018].
(d) Hazard Quotient (HQ) = maximum detected concentration (if non-detect, a surrogate concentration based on one-half the detection limit) / Region 4 ESV for soil
(e) Frequency of detected concentrations exceeding ESV includes detected concentrations only.
(f) Frequency of concentrations exceeding ESV includes detected concentrations and reporting limits for non-detect concentrations.
(g) ESV is for DDD/DDE/DDT (total).
(h) One-half the maximum reporting limit used to calculate screening HQs for non-detect constituents.

Prepared By/Date: LO 05/03/18
Checked By/Date: NSR 06/05/18

Bolded rows indicate constituents selected as PCOPCs.
mg/kg = milligrams per kilogram
PCOPC = Preliminary Chemical of Potential Concern
ESV = Ecological Screening Value
HQ = Hazard Quotient
MDC = Maximum Detected Concentration
NA = Not Applicable

Basis for PCOPC Selection:
(1) Maximum detected concentration exceeds ESV.
(2) Constituent is detected, but no ESV is available.
(3) Constituent is not detected, but the surrogate concentration (i.e., one-half the maximum detection limit) is greater than the ESV. Constituent is bioaccumulative and has wildlife ESVs available.

Table D-2
Selection of Ecological Preliminary Chemicals of Potential Concern (PCOPCs) in Sediment
Former Estech Chemicals Site
Atlanta, GA

Constituent	Frequency of Detection [a]	Minimum Detected Concentration [a]	Maximum Detected Concentration [a] (MDC)	Location of MDC	Range of Reporting Limits [b]	EPA Region 4 Sediment ESVs [c]	Max. Hazard Quotient (HQ) [d]	Number of Detected Concentrations Exceeding ESV [e]	Number of Concentrations Exceeding ESV [f]	Ecological PCOPC? (Y/N)	Basis for PCOPC Selection
METALS (mg/kg dw)											
Arsenic	**6 / 6**	**4.4**	**50.7**	**SED-101**	**NA - NA**	**9.8**	**5.2**	**2**	**2**	**Y**	**(1)**
Lead	**6 / 6**	**30.9**	**92**	**SED-104**	**NA - NA**	**35.8**	**2.6**	**4**	**4**	**Y**	**(1)**
PESTICIDES (mg/kg)											
alpha-BHC	**3 / 6**	**0.011**	**0.054**	**SED-104**	**0.002 - 0.002**	**0.0003**	**180**	**3**	**6**	**Y**	**(1)**
beta-BHC	**4 / 6**	**0.0024**	**0.065**	**Main Point**	**0.002 - 0.002**	**0.005 aq**	**13**	**3**	**3**	**Y**	**(1)**
beta-BHC	**4 / 6**	**0.0024**	**0.065**	**Main Point**	**0.002 - 0.002**	**0.3 wl**	**0.22**	**0**	**0**	**Y**	**(2)**
Chlordane	**2 / 6**	**0.012**	**0.062**	**SED-104**	**0.002 - 0.054**	**0.0032 aqwl**	**19**	**2**	**3**	**Y**	**(1)**
Chlordane	**2 / 6**	**0.012**	**0.062**	**SED-104**	**0.002 - 0.054**	**0.00006 wl**	**1033**	**2**	**6**	**Y**	**(1)**
4,4'-DDD	**5 / 6**	**0.0025**	**0.89**	**SED-104**	**0.01 - 0.01**	**0.0035 aqwl**	**254**	**4**	**5**	**Y**	**(1)**
4,4'-DDE	**4 / 6**	**0.0021**	**0.034**	**SED-104**	**0.002 - 0.01**	**0.0014 aqwl**	**24**	**4**	**6**	**Y**	**(1)**
4,4'-DDT	**4 / 6**	**0.0041**	**0.34**	**SED-104**	**0.002 - 0.01**	**0.001 aq**	**340**	**4**	**6**	**Y**	**(1)**
delta-BHC	**3 / 6**	**0.0076**	**0.029**	**SED-104**	**0.002 - 0.002**	**NA**	**NA**	**NA**	**NA**	**Y**	**(3)**
Dieldrin	**4 / 6**	**0.0032**	**0.09**	**SED-104**	**0.002 - 0.002**	**0.0019 aqwl**	**46**	**4**	**6**	**Y**	**(1)**
Dieldrin	**4 / 6**	**0.0032**	**0.088**	**SED-104**	**0.002 - 0.002**	**0.0077 wl**	**11**	**3**	**3**	**Y**	**(1)**
gamma-BHC (lindane)	**3 / 6**	**0.0067**	**0.03**	**SED-104**	**0.002 - 0.002**	**0.0024 aq**	**13**	**3**	**3**	**Y**	**(1)**
gamma-BHC (lindane)	**3 / 6**	**0.0067**	**0.030**	**SED-104**	**0.002 - 0.002**	**0.01 wl**	**3.0**	**1**	**1**	**Y**	**(1)**
Heptachlor	**1 / 6**	**0.0049**	**0.0049**	**SED-104**	**0.002 - 0.0054**	**0.0006 aqwl**	**8.2**	**1**	**6**	**Y**	**(1)**
Methoxychlor	0 / 6	--	--	NA	0.002 - 0.054	0.03 aqwl	0.90 (g)	0	1	N	(5)
Toxaphene	**0 / 6**	**--**	**--**	**NA**	**0.050 - 0.54**	**0.0001 aqwl**	**2700 (g)**	**0**	**6**	**Y**	**(4)**

Notes:
(a) Includes 2000 and 2004 sediment samples.
(b) Range of reporting limits for non-detect samples.
(c) USEPA Region 4 ERA Supplemental Guidance; Table 2a Freshwater Sediment Ecological Screening Values (ESVs) [USEPA, 2018].
(d) Hazard Quotient (HQ) = maximum detected concentration (if non-detect, a surrogate concentration based on one-half the detection limit) / Region 4 ESV for sediment
(e) Frequency of detected concentrations exceeding ESV includes detected concentrations only.
(f) Frequency of concentrations exceeding ESV includes detected concentrations and reporting/method detection limits for non-detect concentrations.
(g) One-half the maximum detection limit used to calculate screening HQs for non-detect constituents.

Prepared By/Date: LO 05/04/18
Checked By/Date: NSR 06/05/18

Bolded constituents selected as PCOPCs.
mg/kg = milligrams per kilogram
PCOPC = Preliminary Chemical of Potential Concern
ESV = Ecological Screening Value
HQ = Hazard Quotient
MDC = Maximum Detected Concentration
NA = Not Applicable
aq = Aquatic life criteria (bioaccumulative constituent)
wl = Wildlife based criteria (bioaccumulative constituent)
aqwl = Aquatic life and wildlife based criterion (bioaccumulative constituent)

Basis for PCOPC Selection:
(1) Maximum detected concentration exceeds ESV.
(2) Maximum detected concentration exceeds one or both ESVs protective of aquatic life and/or protective of wildlife (bioaccumulative constituent)
(3) Constituent is detected, but no ESV is available.
(4) Constituent is not detected and the surrogate concentration (i.e., one-half the maximum detection limit) is greater than the ESV.
(5) Constituent is not detected and the surrogate concentration (i.e., one-half the maximum detection limit) is less than the ESV.

Table D-3a
Selection of Ecological Preliminary Chemicals of Potential Concern (PCOPCs) in Surface Water
Former Estech Chemicals Site
Atlanta, GA

Constituent	Frequency of Detection [(a)]	Minimum Detected Concentration [(a)]	Maximum Detected Concentration [(a)] (MDC)	Location of MDC	Range of Reporting Limits [(b)]	Applicable Surface Water ESVs		Max. Hazard Quotient (HQ) [(f)]	Number of Detected Concentrations Exceeding ESV [(g)]	Number of Concentrations Exceeding ESV [(h)]	Ecological PCOPC? (Y/N)	Basis for PCOPC Selection
METALS - DISSOLVED (mg/L)												
Arsenic	3 / 40	0.0053	0.0061	SW-2010-5	0.0050 - 0.0050	0.15	(c), (d)	0.041	0	0	N	(5)
Copper	**40 / 40**	**0.0047**	**0.90**	**SW-2014-21**	**NA - NA**	**0.020**	**(e)**	**46**	**23**	**23**	**Y**	**(1)**
Lead	0 / 40	--	--	NA	0.0010 - 0.0010	0.0067	(e)	0.074	0	0	N	(4)
Zinc	**40 / 40**	**0.15**	**12**	**SW-2014-21**	**NA - NA**	**0.26**	**(e)**	**48**	**36**	**36**	**Y**	**(1)**
PESTICIDES (mg/L)												
alpha-BHC	**38 / 40**	**0.000050**	**0.00054**	**SW-2014-20**	**0.000050 - 0.000050**	**0.000010**	**(c), aq**	**54**	**38**	**40**	**Y**	**(1)**
beta-BHC	**35 / 40**	**0.000057**	**0.0039**	**SW-2014-21**	**0.000050 - 0.000050**	**0.000010**	**(c), aq**	**390**	**35**	**40**	**Y**	**(1)**
alpha-Chlordane	0 / 40	--	--	NA	0.000050 - 0.000050	NA		NA	NA	NA	N	(6)
gamma-Chlordane	0 / 40	--	--	NA	0.000050 - 0.000050	NA		NA	NA	NA	N	(6)
4,4'-DDD	0 / 40	--	--	NA	0.00010 - 0.0010	0.000010	(c), aq	50 (i)	0	40	N	(3)
4,4'-DDE	0 / 40	--	--	NA	0.00010 - 0.0010	0.00030	(c), aq	1.7 (i)	0	8	N	(3)
4,4'-DDT	**0 / 40**	**--**	**--**	**NA**	**0.00010 - 0.0010**	**0.0000010**	**(c), (d), aqwl**	**500 (i)**	**0**	**40**	**Y**	**(3)**
delta-BHC	**32 / 40**	**0.000068**	**0.00030**	**SW-2010-14**	**0.000050 - 0.000050**	**NA**		**NA**	**NA**	**NA**	**Y**	**(2)**
Dieldrin	**0 / 40**	**--**	**--**	**NA**	**0.00010 - 0.0010**	**0.000056**	**(d), aqwl**	**8.9 (i)**	**0.0**	**40**	**Y**	**(3)**
gamma-BHC (lindane)	**30 / 40**	**0.000070**	**0.00025**	**SW-2014-20**	**0.000050 - 0.000050**	**0.00011**	**(c), aqwl**	**2.3**	**11**	**11**	**Y**	**(1)**
Heptachlor	0 / 40	--	--	NA	0.000050 - 0.000050	0.0000038	(d), aq	6.6 (i)	0	40	N	(6)
Methoxychlor	0 / 40	--	--	NA	0.00050 - 0.00050	0.000030	(c), aq	8.3 (i)	0	40	N	(6)
Toxaphene	0 / 40	--	--	NA	0.0030 - 0.0030	0.00000020	(c), (d), aq	7,500 (i)	0	40	N	(6)

Notes:
(a) Includes 2016-2018 surface water samples from five monitoring events.
(b) Range of reporting limits for non-detect samples.
(c) USEPA Region 4 ERA Supplemental Guidance; Table 1a Freshwater Ecological Screening Values (ESVs) for chronic exposure (USEPA, 2018).
(d) Georgia Administrative Code Rule 391-3-6-.03 (5)(e)(i-iii) Water Use Classifications and Water Quality Standards of the Rules and Regulations for Water Quality Control (2015).
(e) Site-specific ESV calculated for hardness-dependent metals. See Table D-3b.
(f) Hazard Quotient (HQ) = maximum detected concentration (if non-detect, a surrogate concentration based on one-half the detection limit) / Region 4 ESV
(g) Frequency of detected concentrations exceeding ESV includes detected concentrations only.
(h) Frequency of concentrations exceeding ESV includes detected concentrations and reporting limits for non-detect concentrations.
(i) One-half the maximum detection limit used to calculate screening HQs for non-detect constituents.

Prepared By/Date: LO 06/19/2018
Checked By/Date: IMR 06/21/2018

Bolded constituents selected as COPCs.
µg/L = micrograms per liter
PCOPC = Preliminary Chemical of Potential Concern
ESV = Ecological Screening Value
HQ = Hazard Quotient
MDC = Maximum Detected Concentration
NA = Not Applicable
aq = Protective of aquatic life (does not account for bioaccumulation in upper trophic levels)
aqwl = Aquatic life and wildlife based criterion (bioaccumulative constituent)

Basis for PCOPC Selection:
(1) Maximum detected concentration exceeds ESV.
(2) Constituent is detected, but no ESV is available.
(3) Constituent is not detected, but the surrogate concentration (i.e., one-half the maximum detection limit) is greater than the ESV.
(4) Constituent is not detected and the surrogate concentration (i.e., one-half the maximum detection limit) is less than the ESV.
(5) Maximum detected concentration is less than ESV.
(6) Per Region 4 guidance (USEPA, 2018), non-detected bioaccumulative chemicals that do not have a wildlife-based ESV are not retained as PCOPCs.

Table D-3b
Calculation of National Recommended Water Quality Criteria for Select Hardness-Dependent Metals
Former Estech Chemicals Site
Atlanta, GA

Parameter	USEPA Formula for Determining Hardness-Dependent CCC (µg/L)[a, b]	Freshwater Conversion Factor (CF)[a, b]	Hardness (mg/L)[c]	CCC for Dissolved Metals (µg/L)
Copper	$e^{[0.8545(ln\ hardness)]-1.702} * CF$	0.96	250	19.6
Lead	$e^{[1.273(ln\ hardness)]-4.705} * CF$	1.46203-[(*ln* hardness)(0.145712)]	250	6.72
Zinc	$e^{[0.8473(ln\ hardness)]+0.884} * CF$	0.986	250	257

Notes:

(a) USEPA Region 4 ERA Supplemental Guidance; Table 1b Conversion Factors and Hardness-Dependent Equations (USEPA, 2018).

(b) Georgia Administrative Code Rule 391-3-6-.03 (5)(e)(ii) Water Use Classifications and Water Quality Standards of the Rules and Regulations for Water Quality Control - General Criteria for All Waters.

(c) Average hardness of 250 mg/L; based on available 2016 surface water data.

CCC = Criterion Continuous Concentration (Chronic)

ln hardness = natural log of hardness as mg/L $CaCO_3$

µg/L = microgram per liter

mg/L = milligram per liter

Prepared By/Date: LO 06/05/18
Checked By/Date: NSR 06/06/18

Table D-4
Refinement of Ecological Chemicals of Potential Concern (COPCs) in Surface Soil
Former Estech Chemicals Site
Atlanta, GA

Constituent	Frequency of Detection [a]	Maximum Detected Concentration [a]	Mean Detected Concentration [a]	Ecological Soil RSVs[b]		Number of Detected Concentrations Exceeding RSV	Max. Hazard Quotient (HQ^{max}) [c]	95% UCL	95% UCL Distribution	95% UCL Hazard Quotient (HQ^{UCL}) [d]	Ecological COPC? (Y/N)	Basis for COPC Refinement Selection
METALS (mg/kg)												
Arsenic	**115 / 144**	**2,430**	**150**	**43**	**A**	**64**	**57**	**163**	**95% KM H-UCL**	**3.8**	**Y**	**(1)**
Copper	**144 / 144**	**2,360**	**210**	**28**	**A**	**121**	**84**	**328**	**95% Chebyshev (Mean, Sd) UCL**	**12**	**Y**	**(1)**
Lead	**144 / 144**	**78,400**	**2,612**	**11**	**A**	**144**	**7127**	**3758**	**95% Chebyshev (MVUE) UCL**	**342**	**Y**	**(1)**
Zinc	**142 / 144**	**4,730**	**546**	**46**	**A**	**139**	**103**	**652**	**95% KM H-UCL**	**14**	**Y**	**(1)**
PESTICIDES (mg/kg)												
alpha-BHC	14 / 144	1.1	0.196	59	M	0	0.019	0.0497	95% KM Approximate Gamma UCL	0.00084	N	(2)
beta-BHC	**48 / 144**	**99**	**4.29**	**0.27**	**M**	**22**	**367**	**0.754**	**95% KM H-UCL**	**2.8**	**Y**	**(1)**
alpha-Chlordane	27 / 144	23	1.78	0.27	M,A	11	85	0.0991	95% KM H-UCL	0.37	N	(2)
gamma-Chlordane	37 / 144	69	2.918	2.2	A	5	31	0.299	95% KM H-UCL	0.14	N	(2)
4,4'-DDD	**36 / 144**	**27**	**2.446**	**NA**		**NA**	**NA**	**1.81**	**95% KM(Chebyshev) UCL**	**NA**	**Y**	**(3, 1)**
4,4'-DDE	**102 / 144**	**25**	**0.919**	**NA**		**NA**	**NA**	**2.17**	**95% KM H-UCL**	**NA**	**Y**	**(3, 1)**
4,4'-DDT	**117 / 144**	**1600**	**33**	**NA**		**NA**	**NA**	**60.35**	**95% KM H-UCL**	**NA**	**Y**	**(3, 1)**
Total DDT	**117 / 144**	**1652**	**36**	**0.021**	**Total**	**NA**	**NA**	**64.33**	**NA**	**3063**	**Y**	**(1)**
delta-BHC	5 / 144	1.90	0.44	0.27	(surr) beta-BHC	1	7	0.0791	95% KM Approximate Gamma UCL	0.29	N	(2)
Dieldrin	**43 / 144**	**29**	**2.36**	**0.0049**	**M**	**43**	**5918**	**0.646**	**95% KM H-UCL**	**132**	**Y**	**(1)**
gamma-BHC (lindane)	**9 / 144**	**0.99**	**0.23**	**0.0095**	**M**	**9**	**104**	**0.0416**	**95% KM Approximate Gamma UCL**	**4.4**	**Y**	**(1)**
Heptachlor	10 / 144	41	6.635	0.0590	M	8	695	0.02	95% KM H-UCL	0.28	N	(2)
Methoxychlor	0 / 144	--	--	5.1	M	0	23	NA	NA	NA	N	(4)
Toxaphene	15 / 144	21.0	7.65	4.1	A	10	5.1	2.01	95% KM (t) UCL	0.49	N	(2)

Notes:
(a) Includes soil samples (0' to 1') collected in 2018.
(b) USEPA Region 4 ERA Supplemental Guidance; Table 3 Soil Ecological Screening Values (2018). RSV is the lower of the avian and mammalian ESVs.
(c) Max. Hazard Quotient (HQ) = maximum detected concentration (if non-detect, a surrogate concentration based on one-half the detection limit) / Region 4 RSV for soil
(d) UCL Hazard Quotient (HQ) = 95% UCL concentration / Region 4 RSV for soil

Prepared By/Date: LO 06/12/18
Checked By/Date: NSR 06/13/18

Bolded rows indicate constituents selected as COPCs.
mg/kg = milligrams per kilogram
COPC = Chemical of Potential Concern
ESV = Ecological Screening Value
RSV = Refined Screening Value
HQ = Hazard Quotient
NA = Not Applicable
A = Avian
M = Mammalian
surr = Surrogate RSV used

Basis for COPC Selection:
(1) Constituent was frequently detected and 95% UCL HQ was greater than 1.
(2) 95% UCL HQ was less than 1.
(3) Constituent is a member of a class of compounds. The total concentration is screened against the RSV for the total compound in that class.
(4) Constituent was not detected in any sample. Qualitative evaluation conducted in SLERA.

Table D-5
Refinement of Ecological Chemicals of Potential Concern (COPCs) in Sediment
Former Estech Chemicals Site
Atlanta, GA

Constituent	Frequency of Detection [a]	Maximum Detected Concentration [a]	Mean Detected Concentration [a]	EPA Region 4 Ecological Sediment RSVs [b]		Number of Detected Concentrations Exceeding RSV	Max. Hazard Quotient (HQ^{max}) [c]	95% UCL	95% UCL Distribution	95% UCL Hazard Quotient (HQ^{UCL}) [d]	Ecological COPC? (Y/N)	Basis for COPC Selection
METALS (mg/kg dw)												
Arsenic	**6 / 6**	**50.7**	**14.5**	**33**		**1**	**1.5**	**50.7**	**Maximum**	**1.5**	**Y**	**(1)**
Lead	6 / 6	92	52.02	128		0	0.71	71.35	95% Student's-t UCL	0.56	N	(2)
PESTICIDES (mg/kg)												
alpha-BHC	**3 / 6**	**0.054**	**0.027**	**0.0060**		**3**	**9.0**	**0.0331**	**95% KM (t) UCL**	**5.5**	**Y**	**(1)**
beta-BHC	**4 / 6**	**0.065**	**0.0264**	**0.0072**	**aq**	**3**	**9.0**	**0.0398**	**95% KM (t) UCL**	**5.5**	**Y**	**(1)**
beta-BHC	**4 / 6**	**0.065**	**0.0264**	**1.5**	**wl**	**0**	**0.043**	**0.0398**	**95% KM (t) UCL**	**0.027**	**Y**	**(3)**
Chlordane	**2 / 6**	**0.062**	**0.037**	**0.018**	**aqwl**	**1**	**3.4**	**0.062**	**Maximum**	**3.4**	**Y**	**(1)**
Chlordane	**2 / 6**	**0.062**	**0.037**	**1.7**	**wl**	**0**	**0.036**	**0.062**	**Maximum**	**0.036**	**Y**	**(3)**
4,4'-DDD	**5 / 6**	**0.89**	**0.192**	**0.0085**	**aqwl**	**4**	**105**	**0.89**	**Maximum**	**105**	**Y**	**(1)**
4,4'-DDE	**4 / 6**	**0.034**	**0.0122**	**0.0068**	**aqwl**	**2**	**5.0**	**0.0201**	**95% KM (t) UCL**	**3.0**	**Y**	**(1)**
4,4'-DDT	**4 / 6**	**0.34**	**0.102**	**0.0070**	**aq**	**2**	**49**	**0.185**	**95% KM (t) UCL**	**26**	**Y**	**(1)**
delta-BHC	**3 / 6**	**0.03**	**0.020**	**0.0060**	**(surr) alpha-BHC aq**	**3**	**4.8**	**0.0216**	**95% KM (t) UCL**	**3.6**	**Y**	**(1)**
Dieldrin	**4 / 6**	**0.088**	**0.029**	**0.062**	**aqwl**	**1**	**1.4**	**0.088**	**Maximum**	**1.4**	**Y**	**(1)**
Dieldrin	**4 / 6**	**0.088**	**0.029**	**0.010**	**wl**	**3**	**8.8**	**0.088**	**Maximum**	**8.8**	**Y**	**(1)**
gamma-BHC (lindane)	**3 / 6**	**0.03**	**0.015**	**0.0050**	**aq**	**3**	**6.0**	**0.0185**	**95% KM (t) UCL**	**3.7**	**Y**	**(1)**
gamma-BHC (lindane)	**3 / 6**	**0.030**	**0.015**	**0.10**	**wl**	**0**	**0.30**	**0.0185**	**95% KM (t) UCL**	**0.19**	**Y**	**(3)**
Heptachlor	1 / 6	0.0049	NA	0.075	aqwl	0	0.065	0.0049	Maximum	0.065	N	(2)
Toxaphene	0 / 6	--	NA	0.032	aqwl	0	8.4 (e)	NA	NA	NA	N	(4)

Notes:
(a) Includes 2000 and 2004 sediment samples.
(b) USEPA Region 4 ERA Supplemental Guidance; Table 2a Freshwater Sediment Ecological Refinement Screening Values (RSVs) [USEPA, 2018].
(c) Max. Hazard Quotient (HQ) = maximum detected concentration (if non-detect, a surrogate concentration based on one-half the detection limit) / Region 4 RSV for sediment
(d) UCL Hazard Quotient (HQ) = 95% UCL concentration / Region 4 RSV for sediment
(e) One-half the maximum detection limit used to calculate screening HQ for non-detect constituent.

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Checked By/Date: NSR 06/13/18

Bolded rows indicate constituents selected as COPCs.
mg/kg = milligrams per kilogram
COPC = Chemical of Potential Concern
ESV = Ecological Screening Value
RSV = Refined Screening Value
HQ = Hazard Quotient
NA = Not Applicable
surr = Surrogate RSV used
aq = Aquatic life criteria (bioaccumulative constituent)
wl = Wildlife based criteria (bioaccumulative constituent)
aqwl = Aquatic life and wildlife based criterion (bioaccumulative constituent)

Basis for PCOPC Selection:
(1) Constituent was frequently detected and 95% UCL HQ was greater than 1.
(2) 95% UCL HQ was less than 1.
(3) 95% UCL HQ was greater than 1 for the RSV protective of aquatic life (bioaccumulative constituent).
(4) Constituent was not detected in any sample. Qualitative evaluation conducted in SLERA.

Table D-6
Refinement of Ecological Chemicals of Potential Concern (COPCs) in Surface Water
Former Estech Chemicals Site
Atlanta, GA

Constituent	Frequency of Detection [a]	Maximum Detected Concentration [a]	Mean Detected Concentration [a]	Applicable Surface Water ESVs [b]	Number of Detected Concentrations Exceeding ESV	Max. Hazard Quotient (HQ^{max}) [f]	95% UCL	95% UCL Distribution	95% UCL Hazard Quotient (HQ^{UCL}) [h]	Ecological COPC? (Y/N)	Basis for COPC Selection
METALS - DISSOLVED (mg/L)											
Copper	**40 / 40**	**0.90**	**0.13**	**0.020 (e)**	**23**	**46**	**0.29**	**95% Chebyshev (Mean, Sd) UCL**	**15**	**Y**	**(1)**
Zinc	**40 / 40**	**12**	**2.4**	**0.26 (e)**	**36**	**48**	**4.7**	**95% Chebyshev (Mean, Sd) UCL**	**18**	**Y**	**(1)**
PESTICIDES (mg/L)											
alpha-BHC	**38 / 40**	**0.00054**	**0.00025**	**0.000010 (c), aq**	**38**	**54**	**0.00027**	**95% KM (t) UCL**	**27**	**Y**	**(1)**
beta-BHC	**35 / 40**	**0.0039**	**0.00094**	**0.000010 (c), aq**	**35**	**390**	**0.0016**	**95% KM H-UCL**	**165**	**Y**	**(1)**
4,4'-DDT	0 / 40	--	--	0.0000010 (c), (d), aqwl	0	500 (i)	NA	NA	NA	N	(2)
delta-BHC	**32 / 40**	**0.00030**	**0.00019**	**NA**	**NA**	**NA**	**0.00018**	**95% KM (t) UCL**	**NA**	**Y**	**(3)**
Dieldrin	0 / 40	--	--	0.000056 (d), aqwl	0	8.9 (i)	NA	NA	NA	N	(2)
gamma-BHC (lindane)	**30 / 40**	**0.00025**	**0.00012**	**0.00011 (c), aqwl**	**11**	**2.3**	**0.00012**	**95% KM (t) UCL**	**1.1**	**Y**	**(1)**

Notes:
(a) Includes 2016-2018 surface water samples from five monitoring events.
(b) ESVs used in refinement of COPCs because values are primarily based on State water quality standards so exposure durations relevant to the numerical standard apply.
(c) USEPA Region 4 ERA Supplemental Guidance; Table 1a Freshwater Ecological Screening Values (ESVs) for chronic exposure (USEPA, 2018).
(d) Georgia Administrative Code Rule 391-3-6-.03 (5)(e)(i-iii) Water Use Classifications and Water Quality Standards of the Rules and Regulations for Water Quality Control (2018).
(e) Site-specific ESV calculated for hardness-dependent metals. See Table X.
(f) Max. Hazard Quotient (HQ) = maximum detected concentration (if non-detect, a surrogate concentration based on one-half the detection limit) / Region 4 ESV
(g) Frequency of concentrations exceeding ESV includes detected concentrations and reporting limits for non-detect concentrations.
(h) UCL Hazard Quotient (HQ) = 95% UCL concentration / Region 4 ESV
(i) One-half the maximum detection limit used to calculate screening HQs for non-detect constituents.

Prepared By/Date: LO 06/25/2018
Checked By/Date: IMR 06/25/2018

Bolded constituents selected as COPCs.
mg/L = micrograms per liter
COPC = Chemical of Potential Concern
ESV = Ecological Screening Value
HQ = Hazard Quotient
NA = Not Applicable
aq = Protective of aquatic life (does not account for bioaccumulation in upper trophic levels)
aqwl = Aquatic life and wildlife based criterion (bioaccumulative constituent)

Basis for COPC Selection:
(1) Constituent was frequently detected and 95% UCL HQ was greater than 1.
(2) Constituent was not detected in any sample. Qualitative evaluation conducted in SLERA.
(3) Constituent is frequently detected, is bioacummulative, and no ESV is available.

Table D-7
Exposure Parameters for Ecological Receptors
Former Estech Chemicals Site
Atlanta, GA

Parameter	Terrestrial Bird		Terrestrial Mammal		Semi-Aquatic Mammal	
	Northern Bobwhite		Northern Short-tailed Shrew		Raccoon	
	Value	Source	Value	Source	Value	Source
Body Weight (kg)	0.16	USEPA (1993)	0.017	USEPA (2018)	3.99	USEPA (1993)
Composition of Diet (fraction)						
Soil/sediment	0.093	USEPA (2018)	0.037	USEPA (2018)	0.094	USEPA (2018)
Plants	0.86	USEPA (1993)	0.14	USEPA (1993)	0.50	USEPA (2018)
Invertebrates/Insects	0.14	USEPA (1993)	0.78	USEPA (1993)	0.47	USEPA (2018)
Birds	0	--	0	--	0.03	USEPA (2018)
Mammals	0	--	0.08	USEPA (1993)	0	--
Body Weight Normalized Ingestion Rates						
Normalized Food Ingestion Rate - NIR_F (kg/kg-bw-d, ww)	0.38	Nagy (2001), equation 58	0.30	Nagy (2001), equation 26	0.093	Nagy (2001), equation 34
Normalized Soil/Sediment Ingestion Rate - NIR_S (kg/kg-bw-d, dw)	0.051	Nagy (2001), equation 45	0.18	Nagy (2001), equation 11	0.030	Nagy (2001), equation 33
Normalized Water Ingestion Rate - NIR_W (kg/L-bw-d)	0.02	USEPA (2018)	0.28	USEPA (2018)	0.083	USEPA (2018)
Foraging Range Size (acres)	19.8	USEPA (2018)	1.0	USEPA (1993)	128	USEPA (2018)

Notes:
kg = kilogram
bw= body weight
d = day
dw = dry weight
ww = wet weight
USEPA = U.S. Environmental Protection Agency

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Table D-8
Mammal Toxicity Reference Values
Former Estech Chemical Site
Atlanta, GA

Analyte	NOAEL TRV* (mg/kg-BW-day)	LOAEL TRV* (mg/kg-BW-day)	Test Species NOAEL/LOAEL	Reference NOAEL/LOAEL	Study Duration NOAEL/LOAEL	Study Endpoint NOAEL/LOAEL
Metals						
Arsenic	1.0	4.6	Multiple species	USEPA, 2005a	Multiple studies	Highest bounded NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
Copper	5.6	83	Multiple species	USEPA, 2007a	Multiple studies	Highest bounded NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
Lead	4.7	80	Multiple species/Rat	USEPA, 2005b/Azar et al. 1973 (cited in Sample et al. 1996)	Multiple studies/3 generations	Highest bounded NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Reproduction
Zinc	75	298	Multiple species	USEPA, 2007b	Multiple studies	Geomean NOAEL for Reproduction, Growth/Geomean LOAEL for Reproduction, Growth
Pesticides						
alpha-BHC*	0.40	2.0	Rat	Van Velsen et al. 1986	13 weeks	Chronic NOAEL and LOAEL for Growth
beta-BHC	0.40	2.0	Rat	Van Velsen et al. 1986	14 weeks	Chronic NOAEL and LOAEL for Growth
delta-BHC*	0.40	2.0	Rat	Van Velsen et al. 1986	15 weeks	Chronic NOAEL and LOAEL for Growth
gamma-BHC (lindane)	0.10	1.0	Mink	Beard et al. (1998)	3 generations	LOAEL for Reproduction
Chlordane	4.6	9.2	Mouse	WHO 1984 citing Keplinger et al. (1968)	6 generations	NOAEL and LOAEL for Reproduction
4,4'-DDD**	0.15	4.6	Multiple species	USEPA, 2007c	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
4,4'-DDE**	0.15	4.6	Multiple species	USEPA, 2007c	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
4,4'-DDT**	0.15	4.6	Multiple species	USEPA, 2007c	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
Dieldrin	0.015	1.3	Multiple species	USEPA, 2007d	Multiple studies	Highest bounded NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth

Notes:
*Surrogate -BHC TRVs used.
** TRVs for DDT and metabolites per USEPA 2007c.

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USEPA	United States Environmental Protection Agency
Eco-SSL	Ecological Soil Screening Levels
Geomean	Geometric Mean
mg/kg-BW-day	milligrams per kilogram body weight per day
NOAEL	No Observed Adverse Effects Level
LOAEL	Lowest Observed Adverse Effects Level
TRV	Toxicity Reference Value

Sources:

USEPA, 2005a. Ecological Soil Screening Levels for Arsenic
USEPA, 2005b. Ecological Soil Screening Levels for Lead
USEPA, 2007a. Ecological Soil Screening Levels for Copper
USEPA, 2007b. Ecological Soil Screening Levels for Zinc
USEPA, 2007c. Ecological Soil Screening Levels for DDT and Metabolites
USEPA, 2007d. Ecological Soil Screening Levels for Dieldrin
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Table D-9
Avian Toxicity Reference Values
Former Estech Chemicals Site
Atlanta, GA

Analyte	NOAEL TRV* (mg/kg-BW-day)	LOAEL TRV* (mg/kg-BW-day)	Test Species NOAEL/LOAEL	Reference NOAEL/LOAEL	Study Duration NOAEL/LOAEL	Study Endpoint NOAEL/LOAEL
Metals						
Arsenic	2.2	4.5	Multiple species	USEPA, 2005a	Multiple studies	Lowest NOAEL for Reproduction, Growth, Survival/Geomean LOAEL for Reproduction, Growth
Copper	4.1	35	Multiple species	USEPA, 2007a	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
Lead	1.6	11	Multiple species/Japanese quail	USEPA, 2005b/Edens et al. 1976 (cited in Sample et al. 1996)	Multiple studies/12 weeks	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Reproduction
Zinc	66	170	Multiple species	USEPA, 2007b	Multiple studies	Geomean NOAEL for Reproduction, Growth/Geomean LOAEL for Reproduction, Growth
Pesticides						
alpha-BHC*	1.5	4.5	Mallard Duck	Chakravarty and Lahiri (1986)	8 weeks	NOAEL and LOAEL for Reproduction
beta-BHC	1.5	4.5	Mallard Duck	Chakravarty and Lahiri (1986)	8 weeks	NOAEL and LOAEL for Reproduction
delta-BHC*	1.5	4.5	Mallard Duck	Chakravarty and Lahiri (1986)	8 weeks	NOAEL and LOAEL for Reproduction
gamma-BHC (lindane)	1.5	4.5	Mallard Duck	Chakravarty and Lahiri (1986)	8 weeks	NOAEL and LOAEL for Reproduction
Chlordane	2.1	11	Red-winged Blackbird	Stickel et al. 1983	12 weeks	NOAEL and LOAEL for Mortality
4,4'-DDD**	0.23	3.5	Multiple species	USEPA, 2007c	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
4,4'-DDE**	0.23	3.5	Multiple species	USEPA, 2007c	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
4,4'-DDT**	0.23	3.5	Multiple species	USEPA, 2007c	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth
Dieldrin	0.071	0.80	Multiple species	USEPA, 2007d	Multiple studies	Highest NOAEL lower than lowest bounded LOAEL for Reproduction,Growth,Survival/Geomean LOAEL for Reproduction, Growth

Notes:
*Surrogate -BHC TRVs used.
** TRVs for DDT and metabolites per USEPA 2007c.

USEPA	United States Environmental Protection Agency
Eco-SSL	Ecological Soil Screening Levels
Geomean	Geometric Mean
mg/kg-BW-day	milligrams per kilogram body weight per day
NOAEL	No Observed Adverse Effects Level
LOAEL	Lowest Observed Adverse Effects Level
TRV	Toxicity Reference Value

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CHECKED BY/DATE: NSR 06/18/18

Sources:
USEPA, 2005a. Ecological Soil Screening Levels for Arsenic
USEPA, 2005b. Ecological Soil Screening Levels for Lead
USEPA, 2007a. Ecological Soil Screening Levels for Copper
USEPA, 2007b. Ecological Soil Screening Levels for Zinc
USEPA, 2007c. Ecological Soil Screening Levels for DDT and Metabolites
USEPA, 2007d. Ecological Soil Screening Levels for Dieldrin
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Stickel, L. F., W. H. Stickel, R. A. Dyrland, and D. L. Hughes. 1983. Oxychlordane, HCS-3260, and nonachlor in birds: lethal residues and loss rates. J. Toxicol. Environ. Health. 12: 611-622.
Sample et al. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. ES/ER/TM-86/R3. June 1996.
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Table D-10
Bioconcentration Factors*
Former Estech Chemicals Site
Atlanta, GA

Analyte	BCF_V (dw tissue/dw soil)		BCF_V Converted (c) (ww tissue/dw soil)	BCF_{INV} (ww tissue/dw soil)		BCF_{BIRD} (ww tissue/dw soil)		BCF_M (ww tissue/dw soil)	
Metals									
Arsenic	3.60E-02		1.08E-02	1.10E-01		1.27E-03	(f)	2.88E-06	
Copper	4.00E-01		1.20E-01	4.00E-02		1.27E-03	(f)	1.73E-07	(f)
Lead	4.50E-02		1.35E-02	3.00E-02		1.27E-03	(f)	4.32E-07	
Zinc	1.20E-12		3.60E-13	5.60E-01		1.05E-04		1.29E-07	
Pesticides									
alpha-BHC	2.47E-01	(a)	7.41E-02	1.40E+00	(d)	2.45E-05	(d)	3.74E-06	(d)
beta-BHC	2.42E-01	(a)	7.26E-02	1.40E+00	(d)	2.45E-05	(d)	3.74E-06	(d)
delta-BHC	1.55E-01	(a, b)	4.65E-02	1.40E+00	(d)	2.45E-05	(d)	3.74E-06	(d)
gamma-BHC	2.70E-01	(a)	8.10E-02	1.40E+00	(d)	2.45E-05	(d)	3.74E-06	(d)
Chlordane	1.32E-02	(a, b)	3.96E-03	1.40E+00	(d)	2.45E-05	(d)	3.74E-06	(d)
DDD	4.77E-03	(a)	1.43E-03	1.26E+00	(e)	4.28E-04	(e)	6.52E-05	(e)
DDE	9.37E-03		2.81E-03	1.26E+00		4.28E-04		6.52E-05	
DDT	6.50E-03	(a)	1.95E-03	1.26E+00	(e)	4.28E-04	(e)	6.52E-05	(e)
Dieldrin	9.15E-02	(a, b)	2.75E-02	1.40E+00	(d)	2.45E-05	(d)	3.74E-06	(d)

Notes:
* BCF Source: USEPA, 1999. *Screening Level Ecological Risk Assessment Guidance for Hazardous Waste Combustion Facilities* . EPA530 D 99 001A. Office of Solid Waste and Emergency Response. August 1999.

BCF_{INV} = Bioconcentration factor for soil-to-soil invertebrates

BCF_V = Bioconcentration factor for soil-to-vegetation

BCF_M = Bioconcentration factor for soil/sediment-to-small mammals (based on deer mouse)

BCF_B = Bioconcentration factor for birds (based on northern bobwhite)

(a) BCF calculated from Kow values; Kow values are from Technical Support Document of the Hazardous Waste Identification Rule: Risk Assessment for Human and Ecological Receptors (August 1995).
(b) Kow values are from Groundwater Chemicals Desk Reference (Montgomery and Welkom, 1989).
(c) Conversion from dry weight to wet weight assumes 30% solids in vegetation tissue from USEPA, 1993. Wildlife Exposure Factors Handbook. United States Environmental Protection Agency, Office of Research and Development. EPA/600/R-93/187. December, 1993.
(d) BCF for heptachlor used as a surrogate.
(e) BCF for DDE used as a surrogate.
(f) BCF for cadmium used as a surrogate.

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Table D-11
Summary of Surficial Soil[1] EPCs by Exposure Unit for the Short-tailed Shrew
Screening Level Ecological Risk Assessment
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	COPC	Exposure Area	Maximum Soil Concentration[2] (mg/kg, dw)	95% UCL Soil Concentration[3] (mg/kg, dw)	95% UCL Statistic Used
Short-tailed shrew	Arsenic	S01	871	1,088	95% Gamma Adjusted KM-UCL
		S02	2,430	2,430	Maximum[4]
		S03	232	141	95% Student's-t UCL
		S04	573	410	95% Student's-t UCL
		S05	125	47.6	95% Student's-t UCL
		S06	495	322	95% Student's-t UCL
		S07	85	61	95% KM (t) UCL
		S08	122	118	95% Gamma Adjusted KM-UCL
		S09	312	168	95% KM (t) UCL
		S10	19	14	95% KM (t) UCL
		S11	75	49	95% Student's-t UCL
		S12	327	219	95% KM (t) UCL
		S13	386	386	Maximum[4]
		S14	66	49	95% KM (t) UCL
		S15	1,140	557	95% KM (t) UCL
		S16	253	136	95% Student's-t UCL
		S17	69	36	95% KM (t) UCL
		S18	28	16	95% KM (t) UCL
	Copper	S01	1,790	1,492	95% Chebyshev (Mean, Sd) UCL
		S02	514	389	95% Student's-t UCL
		S03	784	415	95% Student's-t UCL
		S04	1,270	844	95% Student's-t UCL
		S05	457	292	95% Chebyshev (Mean, Sd) UCL
		S06	2,360	1,827	95% Adjusted Gamma UCL
		S07	283	254	95% Adjusted Gamma UCL
		S08	907	769	95% Adjusted Gamma UCL
		S09	526	384	95% Student's-t UCL
		S10	629	629	Maximum[4]
		S11	161	127	95% Student's-t UCL
		S12	606	360	95% Student's-t UCL
		S13	383	352	95% Adjusted Gamma UCL
		S14	129	129	Maximum[4]
		S15	750	708	95% Adjusted Gamma UCL
		S16	120	71.0	95% Student's-t UCL
		S17	52	37	95% Student's-t UCL
		S18	40	29	95% Student's-t UCL
	Lead	S01	7,990	7990	Maximum[4]
		S02	10,100	8268	95% Chebyshev (Mean, Sd) UCL[5]
		S03	45,100	45100	Maximum[4]
		S04	15,100	8833	95% Student's-t UCL
		S05	1,720	1062	95% Chebyshev (Mean, Sd) UCL
		S06	4,340	2,471	95% Student's-t UCL
		S07	990	647	95% Student's-t UCL
		S08	1,060	682	95% Student's-t UCL
		S09	3,600	1,835	95% Student's-t UCL
		S10	1,540	1,378	95% Adjusted Gamma UCL
		S11	486	343	95% Student's-t UCL
		S12	2,550	1,371	95% Student's-t UCL
		S13	13,400	10647	95% Adjusted Gamma UCL
		S14	1,030	748	95% Student's-t UCL
		S15	65,600	65,600	Maximum[4]
		S16	78,400	78,400	Maximum[4]
		S17	997	681	95% Adjusted Gamma UCL
		S18	399	249	95% Student's-t UCL

Table D-11
Summary of Surficial Soil[1] EPCs by Exposure Unit for the Short-tailed Shrew
Screening Level Ecological Risk Assessment
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	COPC	Exposure Area	Maximum Soil Concentration[2] (mg/kg, dw)	95% UCL Soil Concentration[3] (mg/kg, dw)	95% UCL Statistic Used
Short-tailed shrew	Zinc	S01	2,680	2635	95% Adjusted Gamma UCL
		S02	753	647	95% Student's-t UCL
		S03	3,130	2335	95% Adjusted Gamma UCL
		S04	1,530	1099	95% Student's-t UCL
		S05	1,530	941	95% Chebyshev (Mean, Sd) UCL
		S06	4,730	3,741	95% Adjusted Gamma UCL
		S07	1,110	953	95% Adjusted Gamma UCL
		S08	4,620	3,328	95% Adjusted Gamma UCL
		S09	960	651	95% Student's-t UCL
		S10	767	524	95% Student's-t UCL
		S11	524	454	95% Student's-t UCL
		S12	919	669	95% KM (t) UCL
		S13	1,000	872	95% Student's-t UCL
		S14	677	508	95% Student's-t UCL
		S15	1,490	1,373	95% Chebyshev (Mean, Sd) UCL
		S16	780	496	95% Student's-t UCL
		S17	554	511	95% Adjusted Gamma UCL
		S18	890	687	95% Adjusted Gamma UCL
	alpha-BHC	S01	0.12	0.060	1/2 Max RL
		S02	1.1	1.1	Maximum
		S03	0.16	0.16	Maximum
		S04	0.041	0.041	Maximum
		S05	0.25	0.13	1/2 Max RL
		S06	0.19	0.19	Maximum
		S07	3.8	1.9	1/2 Max RL
		S08	0.025	0.025	Maximum
		S09	0.61	0.61	Maximum
		S10	0.24	0.12	1/2 Max RL
		S11	0.061	0.061	Maximum
		S12	0.14	0.14	Maximum
		S13	2.3	1.2	1/2 Max RL
		S14	0.042	0.021	1/2 Max RL
		S15	0.15	0.075	1/2 Max RL
		S16	0.26	0.13	1/2 Max RL
		S17	0.24	0.12	1/2 Max RL
		S18	2.1	1.1	1/2 Max RL
	beta-BHC	S01	0.49	0.317	95% KM (t) UCL
		S02	99	99	Maximum
		S03	1.4	0.88	95% KM (t) UCL
		S04	0.46	0.371	95% KM Adjusted Gamma UCL
		S05	0.12	0.12	Maximum
		S06	1.7	0.84	95% KM (t) UCL
		S07	31	31	Maximum[4]
		S08	0.025	0.025	Maximum
		S09	56	56.0	Maximum[4]
		S10	0.24	0.12	1/2 Max RL
		S11	0.055	0.055	Maximum
		S12	0.59	0.59	Maximum
		S13	0.78	0.780	Maximum
		S14	0.016	0.016	Maximum
		S15	0.15	0.075	1/2 Max RL
		S16	0.38	0.38	Maximum
		S17	0.24	0.12	1/2 Max RL
		S18	0.46	0.46	Maximum

Table D-11
Summary of Surficial Soil[1] EPCs by Exposure Unit for the Short-tailed Shrew
Screening Level Ecological Risk Assessment
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	COPC	Exposure Area	Maximum Soil Concentration[2] (mg/kg, dw)	95% UCL Soil Concentration[3] (mg/kg, dw)	95% UCL Statistic Used
Short-tailed shrew	delta-BHC	S01	0.12	0.060	1/2 Max RL
		S02	1.9	1.9	Maximum
		S03	0.057	0.057	Maximum
		S04	0.21	0.11	1/2 Max RL
		S05	0.25	0.13	1/2 Max RL
		S06	0.2	0.10	1/2 Max RL
		S07	3.8	1.9	1/2 Max RL
		S08	0.21	0.11	1/2 Max RL
		S09	4.9	2.450	1/2 Max RL
		S10	0.24	0.120	1/2 Max RL
		S11	0.13	0.065	1/2 Max RL
		S12	0.061	0.061	Maximum
		S13	0.17	0.170	Maximum
		S14	0.042	0.021	1/2 Max RL
		S15	0.15	0.075	1/2 Max RL
		S16	0.26	0.13	1/2 Max RL
		S17	0.24	0.12	1/2 Max RL
		S18	0.024	0.024	Maximum
	4,4'-DDD	S01	0.46	0.46	Maximum
		S02	15	15	Maximum
		S03	0.36	0.21	95% KM (t) UCL
		S04	0.25	0.17	95% KM (t) UCL
		S05	0.23	0.23	Maximum
		S06	2.5	2.5	Maximum
		S07	0.39	0.39	Maximum
		S08	0.48	0.48	Maximum
		S09	27	27	Maximum
		S10	0.47	0.24	1/2 Max RL
		S11	1.1	0.51	95% KM (t) UCL
		S12	0.88	0.88	Maximum
		S13	22	22.00	Maximum
		S14	0.084	0.042	1/2 Max RL
		S15	0.30	0.15	1/2 Max RL
		S16	0.77	0.77	Maximum
		S17	0.47	0.47	Maximum
		S18	10	10	Maximum
	4,4'-DDE	S01	1	0.65	95% KM (t) UCL
		S02	5.9	5.9	Maximum[4]
		S03	1.6	0.93	95% Student's-t UCL
		S04	2.2	1.8	95% KM Adjusted Gamma UCL
		S05	2.8	1.2	95% KM (t) UCL
		S06	2.4	1.5	95% KM (t) UCL
		S07	1.8	0.95	95% KM (t) UCL
		S08	1.7	1.0	95% Student's-t UCL
		S09	25	25	Maximum[4]
		S10	0.67	0.67	Maximum
		S11	3.0	1.4	95% Student's-t UCL
		S12	1.0	1.0	Maximum
		S13	1.6	1.6	Maximum
		S14	0.68	0.68	Maximum
		S15	0.52	0.28	95% KM (t) UCL
		S16	1.3	0.67	95% KM (t) UCL
		S17	0.70	0.70	Maximum[4]
		S18	0.72	0.32	95% KM (t) UCL

Table D-11
Summary of Surficial Soil[1] EPCs by Exposure Unit for the Short-tailed Shrew
Screening Level Ecological Risk Assessment
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	COPC	Exposure Area	Maximum Soil Concentration[2] (mg/kg, dw)	95% UCL Soil Concentration[3] (mg/kg, dw)	95% UCL Statistic Used
Short-tailed shrew	4,4'-DDT	S01	5.8	3.5	95% KM (t) UCL
		S02	280	280	Maximum[4]
		S03	16	14	95% Adjusted Gamma UCL
		S04	12	6.0	95% Student's-t UCL
		S05	8.6	4.9	95% Adjusted Gamma UCL
		S06	7.9	5.0	95% KM (t) UCL
		S07	130	130	Maximum[4]
		S08	5.5	3.0	95% Student's-t UCL
		S09	1,600	1,600	Maximum[4]
		S10	2	0.99	95% KM (t) UCL
		S11	19	19	Maximum[4]
		S12	19	7.5	95% KM (t) UCL
		S13	1,100	1,100	Maximum[4]
		S14	0.19	0.190	Maximum
		S15	0.38	0.17	95% KM (t) UCL
		S16	17	17	Maximum[4]
		S17	8.0	8.0	Maximum[4]
		S18	340	121	95% KM (t) UCL
	Dieldrin	S01	2.1	2.1	Maximum
		S02	0.56	0.56	Maximum
		S03	0.63	0.34	95% KM (t) UCL
		S04	6.1	5.8	97.5% KM (Chebyshev) UCL
		S05	0.47	0.47	Maximum
		S06	1.5	0.81	95% KM (t) UCL
		S07	24	24	Maximum
		S08	0.53	0.53	Maximum
		S09	29	29	Maximum[4]
		S10	0.47	0.24	1/2 Max RL
		S11	0.35	0.35	Maximum
		S12	0.90	0.90	Maximum
		S13	1.0	1.0	Maximum
		S14	0.084	0.042	1/2 Max RL
		S15	0.30	0.15	1/2 Max RL
		S16	15	15	Maximum
		S17	0.48	0.24	1/2 Max RL
		S18	1.1	1.1	Maximum
	gamma-BHC (lindane)	S01	0.13	0.13	Maximum
		S02	0.99	0.99	Maximum
		S03	0.11	0.11	Maximum
		S04	0.031	0.031	Maximum
		S05	0.25	0.13	1/2 Max RL
		S06	0.2	0.10	1/2 Max RL
		S07	3.8	1.9	1/2 Max RL
		S08	0.21	0.11	1/2 Max RL
		S09	0.44	0.44	Maximum
		S10	0.24	0.12	1/2 Max RL
		S11	0.13	0.065	1/2 Max RL
		S12	0.064	0.064	Maximum
		S13	0.15	0.15	Maximum
		S14	0.042	0.021	1/2 Max RL
		S15	0.15	0.075	1/2 Max RL
		S16	0.26	0.13	1/2 Max RL
		S17	0.24	0.12	1/2 Max RL
		S18	2.1	1.1	1/2 Max RL

Table D-11
Summary of Surficial Soil[1] EPCs by Exposure Unit for the Short-tailed Shrew
Screening Level Ecological Risk Assessment
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	COPC	Exposure Area	Maximum Soil Concentration[2] (mg/kg, dw)	95% UCL Soil Concentration[3] (mg/kg, dw)	95% UCL Statistic Used

Notes:

Prepared by: LO 06/04/2018
Checked by: IMR 06/19/2018

1. Surficial soil samples collected from 0 to 1-feet below ground surface; February 2018
2. For non-detect COPCs, the maximum reporting limit was used for the maximum concentration.
3. For non-detect COPCs, 1/2 the maximum reporting limit (1/2 Max RL) was used for the EPC.
4. ProUCL recommended UCL exceeds maximum.
5. ProUCL recommends to avoid use of H-statistics based 95% UCLs; nonparameteric methods are prefered.
6. For COPCs with < 4 detections, the maximum detected concentration was used for the EPC.

Indicates COPC reported as non-detect for medium.

Abbreviations:
mg/kg, dw = milligrams per kilogram, dry weight
EPC = exposure point concentration
95% UCL = 95% upper confidence limit

Table D-12
Summary of Site-Wide Surficial Soil[1], Surface Water[2], and Sediment[3] EPCs for Ecological Receptors
Screening Level Ecological Risk Assessment
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	Matrix	COPC	Maximum Detected Concentration[4]	95% UCL Concentration[5]	95% UCL Statistic Used
Northern bobwhite & Raccoon	Surficial Soil (mg/kg, dw)	Arsenic	2,430	163	95% KM H-UCL
		Copper	2,360	328	95% Chebyshev (Mean, Sd) UCL
		Lead	78,400	3,758	95% Chebyshev (MVUE) UCL
		Zinc	4,730	652	95% KM H-UCL
		alpha-BHC	1.1	0.050	95% KM Approximate Gamma UCL
		beta-BHC	99	0.75	95% KM H-UCL
		delta-BHC	1.9	0.079	95% KM Approximate Gamma UCL
		gamma-BHC (lindane)	0.99	0.042	95% KM Approximate Gamma UCL
		alpha-Chlordane	23	0.099	95% KM H-UCL
		gamma-Chlordane	69	0.30	95% KM H-UCL
		4,4'-DDD	27	1.8	95% KM(Chebyshev) UCL
		4,4'-DDE	25	2.2	95% KM H-UCL
		4,4'-DDT	1,600	60	95% KM H-UCL
		Dieldrin	29	0.65	95% KM H-UCL
Northern bobwhite & Short-tailed shrew & Raccoon	Surface Water[9] (mg/L, total)	Arsenic	0.0061	0.0061	Maximum[8]
		Copper	0.94	0.30	95% Chebyshev (Mean, Sd) UCL
		Lead	0.0015	0.00076	1/2 Max RL
		Zinc	13	4.7	95% Chebyshev (Mean, Sd) UCL[6]
	Surface Water (mg/L)	alpha-BHC	0.00054	0.00027	95% KM (t) UCL
		beta-BHC	0.0039	0.0016	95% KM H-UCL
		delta-BHC	0.00030	0.00018	95% KM (t) UCL
		gamma-BHC (lindane)	0.00025	0.00012	95% KM (t) UCL
		alpha-Chlordane	0.000050	0.000025	1/2 Max RL
		gamma-Chlordane	0.000050	0.000025	1/2 Max RL
		4,4'-DDD	0.0010	0.00050	1/2 Max RL
		4,4'-DDE	0.0010	0.00050	1/2 Max RL
		4,4'-DDT	0.0010	0.00050	1/2 Max RL
		Dieldrin	0.0010	0.00050	1/2 Max RL
	Sediment (mg/kg, dw)	Arsenic	51	51	Maximum[7]
		Copper	--	--	--
		Lead	92	71	95% Student's-t UCL
		Zinc	--	--	--
		alpha-BHC	0.054	0.054	Maximum[8]
		beta-BHC	0.065	0.040	95% KM (t) UCL
		delta-BHC	0.029	0.029	Maximum[8]
		gamma-BHC (lindane)	0.030	0.030	Maximum[8]
		Chlordane	0.062	0.062	Maximum[8]
		4,4'-DDD	0.89	0.89	Maximum[7]
		4,4'-DDE	0.034	0.020	95% KM (t) UCL
		4,4'-DDT	0.34	0.19	95% KM (t) UCL
		Dieldrin	0.088	0.088	Maximum[7]

Notes:

Prepared by: LO 06/04/2018
Checked by: IMR 06/19/2018

1. Surficial soil samples collected from 0 to 1-feet below ground surface; February 2018.
2. Surface water samples collected in 2016-2018.
3. Sediment samples collected in 2000 and 2004.
4. For non-detect COPCs, the maximum reporting limit was used for the maximum concentration.
5. For non-detect COPCs, 1/2 the maximum reporting limit (1/2 Max RL) was used for the EPC.
6. ProUCL suggested H-statistic based UCL (computed for historical reasons only), but recommends the use of nonparameteric based UCLs instead.
7. ProUCL recommended UCL exceeds maximum.
8. For COPCs with < 4 detections, the maximum detected concentration was used for the EPC.
9. Total surface water metals concentrations calculated from dissolved concentrations; see Table X.

Indicates COPC reported as non-detect for medium.

Abbreviations:
mg/kg, dw = milligrams per kilogram, dry weight
mg/L = milligrams per liter
EPC = exposure point concentration
95% UCL = 95% upper confidence limit

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S01									
Metals									
Arsenic	871	0.0025	96	9.4	0.0061	1.0	28	**27**	
Copper	1,790	0.00031	72	215	0.94	5.6	38	**6.7**	
Lead	7,990	0.0035	240	108	0.0015	4.7	112	**24**	
Zinc	2,680	0.00035	1,501	0.00000000096	13	75	372	**4.9**	
Pesticides									
alpha-BHC	0.12	0.00000045	0.17	0.0089	0.00054	0.40	0.041	0.10	**126**
beta-BHC	0.49	0.0000018	0.69	0.036	0.0039	0.40	0.17	0.42	
delta-BHC	0.12	0.00000045	0.17	0.0056	0.00030	0.40	0.040	0.10	
gamma-BHC (lindane)	0.13	0.00000049	0.18	0.011	0.00025	0.10	0.044	0.44	
4,4'-DDD	0.46	0.000030	0.58	0.00066	0.0010	0.15	0.14	0.94	
4,4'-DDE	1.0	0.000065	1.3	0.0028	0.0010	0.15	0.30	**2.1**	
4,4'-DDT	5.8	0.00038	7.3	0.011	0.0010	0.15	1.7	**12**	
Dieldrin	2.1	0.0000079	2.9	0.058	0.0010	0.015	0.70	**47**	
S02									
Metals									
Arsenic	2,430	0.0070	267	26	0.0061	1.0	79	**76**	
Copper	514	0.000089	21	62	0.94	5.6	11	**2.0**	
Lead	10,100	0.0044	303	136	0.0015	4.7	142	**30**	
Zinc	753	0.000097	422	0.00000000027	13	75	107	**1.4**	
Pesticides									
alpha-BHC	1.1	0.0000041	1.5	0.082	0.00054	0.40	0.37	0.93	**829**
beta-BHC	99	0.00037	139	7.2	0.0039	0.40	33	**83**	
delta-BHC	1.9	0.0000071	2.7	0.088	0.00030	0.40	0.64	**1.6**	
gamma-BHC (lindane)	0.99	0.0000037	1.4	0.080	0.00025	0.10	0.33	**3.3**	
4,4'-DDD	15	0.00098	19	0.021	0.0010	0.15	4.5	**31**	
4,4'-DDE	5.9	0.00038	7.4	0.017	0.0010	0.15	1.8	**12**	
4,4'-DDT	280	0.018	353	0.55	0.0010	0.15	84	**574**	
Dieldrin	0.56	0.0000021	0.78	0.015	0.0010	0.015	0.19	**13**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S03									
Metals									
Arsenic	232	0.00067	26	2.5	0.0061	1.0	7.6	**7.3**	
Copper	784	0.00014	31	94	0.94	5.6	17	**3.0**	
Lead	45,100	0.019	1,353	609	0.0015	4.7	634	**135**	
Zinc	3,130	0.00040	1,753	0.0000000011	13	75	434	**5.8**	
Pesticides									
alpha-BHC	0.16	0.00000060	0.22	0.012	0.00054	0.40	0.054	0.135	**204**
beta-BHC	1.4	0.0000052	2.0	0.10	0.0039	0.40	0.47	1.18	
delta-BHC	0.057	0.00000021	0.080	0.0027	0.00030	0.40	0.019	0.048	
gamma-BHC (lindane)	0.11	0.00000041	0.15	0.0089	0.00025	0.10	0.037	0.37	
4,4'-DDD	0.36	0.000023	0.45	0.00052	0.0010	0.15	0.11	0.74	
4,4'-DDE	1.6	0.00010	2.0	0.0045	0.0010	0.15	0.48	**3.3**	
4,4'-DDT	16	0.0010	20	0.031	0.0010	0.15	4.8	**33**	
Dieldrin	0.63	0.0000024	0.88	0.017	0.0010	0.015	0.21	**14**	
S04									
Metals									
Arsenic	573	0.0017	63	6.2	0.0061	1.0	19	**18**	
Copper	1,270	0.00022	51	152	0.94	5.6	27	**4.8**	
Lead	15,100	0.0065	453	204	0.0015	4.7	212	**45**	
Zinc	1,530	0.00020	857	0.00000000055	13	75	214	**2.8**	
Pesticides									
alpha-BHC	0.041	0.00000015	0.057	0.0030	0.00054	0.40	0.014	0.035	**237**
beta-BHC	0.46	0.0000017	0.64	0.033	0.0039	0.40	0.16	0.39	
delta-BHC	0.21	0.00000079	0.29	0.0098	0.00030	0.40	0.071	0.18	
gamma-BHC (lindane)	0.031	0.00000012	0.043	0.0025	0.00025	0.10	0.011	0.11	
4,4'-DDD	0.25	0.000016	0.32	0.00036	0.0010	0.15	0.076	0.51	
4,4'-DDE	2.2	0.00014	2.8	0.0062	0.0010	0.15	0.66	**4.5**	
4,4'-DDT	12	0.00078	15	0.023	0.0010	0.15	3.6	**25**	
Dieldrin	6.1	0.000023	8.5	0.17	0.0010	0.015	2.0	**136**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S05									
Metals									
Arsenic	125	0.00036	14	1.4	0.0061	1.0	4.1	**3.9**	
Copper	457	0.000079	18	55	0.94	5.6	9.8	**1.7**	
Lead	1,720	0.00074	52	23	0.0015	4.7	24	**5.1**	
Zinc	1,530	0.00020	857	0.00000000055	13	75	214	**2.8**	
Pesticides									
alpha-BHC	0.25	0.00000094	0.35	0.019	0.00054	0.40	0.084	0.21	**49**
beta-BHC	0.12	0.00000045	0.17	0.0087	0.0039	0.40	0.042	0.104	
delta-BHC	0.25	0.00000094	0.35	0.012	0.00030	0.40	0.084	0.21	
gamma-BHC (lindane)	0.25	0.00000094	0.35	0.020	0.00025	0.10	0.084	0.84	
4,4'-DDD	0.23	0.000015	0.29	0.00033	0.0010	0.15	0.070	0.47	
4,4'-DDE	2.8	0.00018	3.5	0.0079	0.0010	0.15	0.84	**5.7**	
4,4'-DDT	8.6	0.00056	11	0.017	0.0010	0.15	2.6	**18**	
Dieldrin	0.47	0.0000018	0.66	0.013	0.0010	0.015	0.16	**11**	
S06									
Metals									
Arsenic	495	0.0014	54	5.3	0.0061	1.0	16	**16**	
Copper	2,360	0.00041	94	283	0.94	5.6	49	**8.8**	
Lead	4,340	0.0019	130	59	0.0015	4.7	61	**13**	
Zinc	4,730	0.00061	2,649	0.0000000017	13	75	654	**8.7**	
Pesticides									
alpha-BHC	0.19	0.00000071	0.27	0.014	0.00054	0.40	0.064	0.16	**108**
beta-BHC	1.7	0.0000064	2.4	0.12	0.0039	0.40	0.57	1.4	
delta-BHC	0.20	0.00000075	0.28	0.0093	0.00030	0.40	0.067	0.17	
gamma-BHC (lindane)	0.20	0.00000075	0.28	0.016	0.00025	0.10	0.068	0.68	
4,4'-DDD	2.5	0.00016	3.2	0.0036	0.0010	0.15	0.75	**5.1**	
4,4'-DDE	2.4	0.00016	3.0	0.0067	0.0010	0.15	0.72	**4.9**	
4,4'-DDT	7.9	0.00052	10	0.015	0.0010	0.15	2.4	**16**	
Dieldrin	1.5	0.0000056	2.1	0.041	0.0010	0.015	0.50	**34**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S07									
Metals									
Arsenic	85	0.00024	9.3	0.91	0.0061	1.0	2.8	**2.7**	
Copper	283	0.000049	11	34	0.94	5.6	6.2	**1.1**	
Lead	990	0.00043	30	13	0.0015	4.7	14	**3.0**	
Zinc	1,110	0.00014	622	0.00000000040	13	75	156	**2.1**	
Pesticides									
alpha-BHC	3.8	0.000014	5.3	0.28	0.00054	0.40	1.3	**3.2**	**862**
beta-BHC	31	0.00012	43	2.3	0.0039	0.40	10	**26**	
delta-BHC	3.8	0.000014	5.3	0.18	0.00030	0.40	1.3	**3.2**	
gamma-BHC (lindane)	3.8	0.000014	5.3	0.31	0.00025	0.10	1.3	**13**	
4,4'-DDD	0.39	0.000025	0.49	0.00056	0.0010	0.15	0.12	0.80	
4,4'-DDE	1.8	0.00012	2.3	0.0051	0.0010	0.15	0.54	**3.7**	
4,4'-DDT	130	0.0085	164	0.25	0.0010	0.15	39	**267**	
Dieldrin	24	0.000090	34	0.66	0.0010	0.015	8.0	**536**	
S08									
Metals									
Arsenic	122	0.00035	13	1.3	0.0061	1.0	4.0	**3.8**	
Copper	907	0.00016	36	109	0.94	5.6	19	**3.4**	
Lead	1,060	0.00046	32	14	0.0015	4.7	15	**3.2**	
Zinc	4,620	0.00060	2,587	0.0000000017	13	75	639	**8.5**	
Pesticides									
alpha-BHC	0.025	0.000000094	0.035	0.0019	0.00054	0.40	0.0086	0.021	**47**
beta-BHC	0.025	0.000000094	0.035	0.0018	0.0039	0.40	0.0095	0.024	
delta-BHC	0.21	0.00000079	0.29	0.0098	0.00030	0.40	0.071	0.18	
gamma-BHC (lindane)	0.21	0.00000079	0.29	0.017	0.00025	0.10	0.071	0.71	
4,4'-DDD	0.48	0.000031	0.60	0.00069	0.0010	0.15	0.14	0.99	
4,4'-DDE	1.7	0.00011	2.1	0.0048	0.0010	0.15	0.51	**3.5**	
4,4'-DDT	5.5	0.00036	6.9	0.011	0.0010	0.15	1.7	**11.3**	
Dieldrin	0.53	0.0000020	0.74	0.015	0.0010	0.015	0.18	**12**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S09									
Metals									
Arsenic	312	0.00090	34	3.4	0.0061	1.0	10	**9.8**	
Copper	526	0.000091	21	63	0.94	5.6	11	**2.0**	
Lead	3,600	0.0016	108	49	0.0015	4.7	51	**11**	
Zinc	960	0.00012	538	0.00000000035	13	75	136	**1.8**	
Pesticides									
alpha-BHC	0.61	0.0000023	0.85	0.045	0.00054	0.40	0.21	0.51	**4,113**
beta-BHC	56	0.00021	78	4.1	0.0039	0.40	19	**47**	
delta-BHC	4.9	0.000018	6.9	0.23	0.00030	0.40	1.6	**4.1**	
gamma-BHC (lindane)	0.44	0.0000016	0.62	0.036	0.00025	0.10	0.15	**1.5**	
4,4'-DDD	27	0.0018	34	0.039	0.0010	0.15	8.1	**55**	
4,4'-DDE	25	0.0016	32	0.070	0.0010	0.15	7.5	**51**	
4,4'-DDT	1,600	0.10	2,016	3.1	0.0010	0.15	482	**3,281**	
Dieldrin	29	0.00011	41	0.80	0.0010	0.015	9.7	**648**	
S10									
Metals									
Arsenic	19	0.000054	2.1	0.20	0.0061	1.0	0.62	0.59	
Copper	629	0.00011	25	75	0.94	5.6	13	**2.4**	
Lead	1,540	0.00067	46	21	0.0015	4.7	22	**4.6**	
Zinc	767	0.000099	430	0.00000000028	13	75	109	**1.4**	
Pesticides									
alpha-BHC	0.24	0.00000090	0.34	0.018	0.00054	0.40	0.081	0.20	**27**
beta-BHC	0.24	0.00000090	0.34	0.017	0.0039	0.40	0.082	0.20	
delta-BHC	0.24	0.00000090	0.34	0.011	0.00030	0.40	0.081	0.20	
gamma-BHC (lindane)	0.24	0.00000090	0.34	0.019	0.00025	0.10	0.081	0.81	
4,4'-DDD	0.47	0.000031	0.59	0.00067	0.0010	0.15	0.14	0.97	
4,4'-DDE	0.67	0.000044	0.84	0.0019	0.0010	0.15	0.20	**1.4**	
4,4'-DDT	2.0	0.00013	2.5	0.0039	0.0010	0.15	0.60	**4.1**	
Dieldrin	0.47	0.0000018	0.66	0.013	0.0010	0.015	0.16	**11**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S11									
Metals									
Arsenic	75	0.00022	8.2	0.81	0.0061	1.0	2.4	**2.4**	
Copper	161	0.000028	6.4	19	0.94	5.6	3.6	0.65	
Lead	486	0.00021	15	6.6	0.0015	4.7	6.8	**1.5**	
Zinc	524	0.000068	293	0.00000000019	13	75	76	**1.0**	
Pesticides									
alpha-BHC	0.061	0.00000023	0.085	0.0045	0.00054	0.40	0.021	0.052	**61**
beta-BHC	0.055	0.00000021	0.077	0.0040	0.0039	0.40	0.020	0.049	
delta-BHC	0.13	0.00000049	0.18	0.0060	0.00030	0.40	0.044	0.109	
gamma-BHC (lindane)	0.13	0.00000049	0.18	0.011	0.00025	0.10	0.044	0.44	
4,4'-DDD	1.1	0.000072	1.4	0.0016	0.0010	0.15	0.33	**2.3**	
4,4'-DDE	3.0	0.00020	3.8	0.0084	0.0010	0.15	0.90	**6.2**	
4,4'-DDT	19	0.0012	24	0.037	0.0010	0.15	5.7	**39**	
Dieldrin	0.35	0.0000013	0.49	0.0096	0.0010	0.015	0.12	**7.8**	
S12									
Metals									
Arsenic	327	0.00094	36	3.5	0.0061	1.0	11	**10**	
Copper	606	0.00010	24	73	0.94	5.6	13	**2.3**	
Lead	2,550	0.0011	77	34	0.0015	4.7	36	**7.6**	
Zinc	919	0.00012	515	0.00000000033	13	75	130	**1.7**	
Pesticides									
alpha-BHC	0.14	0.00000052	0.20	0.010	0.00054	0.40	0.047	0.118	**86**
beta-BHC	0.59	0.0000022	0.83	0.043	0.0039	0.40	0.20	0.50	
delta-BHC	0.061	0.00000023	0.085	0.0028	0.00030	0.40	0.021	0.051	
gamma-BHC (lindane)	0.064	0.00000024	0.090	0.0052	0.00025	0.10	0.022	0.22	
4,4'-DDD	0.88	0.000057	1.1	0.0013	0.0010	0.15	0.27	**1.8**	
4,4'-DDE	1.0	0.000065	1.3	0.0028	0.0010	0.15	0.30	**2.1**	
4,4'-DDT	19	0.0012	24	0.037	0.0010	0.15	5.7	**39**	
Dieldrin	0.90	0.0000034	1.3	0.025	0.0010	0.015	0.30	**20**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S13									
Metals									
Arsenic	386	0.0011	42	4.2	0.0061	1.0	13	**12**	
Copper	383	0.000066	15	46	0.94	5.6	8.2	**1.5**	
Lead	13,400	0.0058	402	181	0.0015	4.7	188	**40**	
Zinc	1,000	0.00013	560	0.00000000036	13	75	141	**1.9**	
Pesticides									
alpha-BHC	2.3	0.0000086	3.2	0.17	0.00054	0.40	0.78	**1.9**	**2,385**
beta-BHC	0.78	0.0000029	1.1	0.057	0.0039	0.40	0.26	0.66	
delta-BHC	0.17	0.00000064	0.24	0.0079	0.00030	0.40	0.057	0.14	
gamma-BHC (lindane)	0.15	0.00000056	0.21	0.012	0.00025	0.10	0.051	0.51	
4,4'-DDD	22	0.0014	28	0.031	0.0010	0.15	6.6	**45**	
4,4'-DDE	1.6	0.00010	2.0	0.0045	0.0010	0.15	0.48	**3.3**	
4,4'-DDT	1,100	0.072	1,386	2.1	0.0010	0.15	332	**2,255**	
Dieldrin	1.0	0.0000037	1.4	0.027	0.0010	0.015	0.34	**22**	
S14									
Metals									
Arsenic	66	0.00019	7.2	0.71	0.0061	1.0	2.2	**2.1**	
Copper	129	0.000022	5.2	15	0.94	5.6	2.9	0.53	
Lead	1,030	0.00044	31	14	0.0015	4.7	14	**3.1**	
Zinc	677	0.000087	379	0.00000000024	13	75	97	**1.3**	
Pesticides									
alpha-BHC	0.042	0.00000016	0.059	0.0031	0.00054	0.40	0.014	0.036	**11**
beta-BHC	0.016	0.000000060	0.022	0.0012	0.0039	0.40	0.0065	0.016	
delta-BHC	0.042	0.00000016	0.059	0.0020	0.00030	0.40	0.014	0.035	
gamma-BHC (lindane)	0.042	0.00000016	0.059	0.0034	0.00025	0.10	0.014	0.14	
4,4'-DDD	0.084	0.0000055	0.11	0.00012	0.0010	0.15	0.026	0.17	
4,4'-DDE	0.68	0.000044	0.86	0.0019	0.0010	0.15	0.21	**1.4**	
4,4'-DDT	0.19	0.000012	0.24	0.00037	0.0010	0.15	0.058	0.39	
Dieldrin	0.084	0.00000031	0.12	0.0023	0.0010	0.015	0.028	**1.9**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S15									
Metals									
Arsenic	1,140	0.0033	125	12	0.0061	1.0	37	**36**	
Copper	750	0.00013	30	90	0.94	5.6	16	**2.8**	
Lead	65,600	0.028	1,968	886	0.0015	4.7	922	**196**	
Zinc	1,490	0.00019	834	0.00000000054	13	75	208	**2.8**	
Pesticides									
alpha-BHC	0.15	0.00000056	0.21	0.011	0.00054	0.40	0.051	0.127	**248**
beta-BHC	0.15	0.00000056	0.21	0.011	0.0039	0.40	0.052	0.129	
delta-BHC	0.15	0.00000056	0.21	0.0070	0.00030	0.40	0.050	0.126	
gamma-BHC (lindane)	0.15	0.00000056	0.21	0.012	0.00025	0.10	0.051	0.51	
4,4'-DDD	0.30	0.000020	0.38	0.00043	0.0010	0.15	0.091	0.62	
4,4'-DDE	0.52	0.000034	0.66	0.0015	0.0010	0.15	0.16	**1.1**	
4,4'-DDT	0.38	0.000025	0.48	0.00074	0.0010	0.15	0.11	0.78	
Dieldrin	0.30	0.0000011	0.42	0.0082	0.0010	0.015	0.10	**6.7**	
S16									
Metals									
Arsenic	253	0.00073	28	2.7	0.0061	1.0	8.3	**7.9**	
Copper	120	0.000021	4.8	14	0.94	5.6	2.8	0.49	
Lead	78,400	0.034	2,352	1,058	0.0015	4.7	1,102	**234**	
Zinc	780	0.00010	437	0.00000000028	13	75	111	**1.5**	
Pesticides									
alpha-BHC	0.26	0.00000097	0.36	0.019	0.00054	0.40	0.088	0.22	**620**
beta-BHC	0.38	0.0000014	0.53	0.028	0.0039	0.40	0.13	0.32	
delta-BHC	0.26	0.00000097	0.36	0.012	0.00030	0.40	0.087	0.22	
gamma-BHC (lindane)	0.26	0.00000097	0.36	0.021	0.00025	0.10	0.088	0.88	
4,4'-DDD	0.77	0.000050	0.97	0.0011	0.0010	0.15	0.23	**1.6**	
4,4'-DDE	1.3	0.000085	1.6	0.0037	0.0010	0.15	0.39	**2.7**	
4,4'-DDT	17	0.0011	21	0.033	0.0010	0.15	5.1	**35**	
Dieldrin	15	0.000056	21	0.41	0.0010	0.015	5.0	**335**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S17									
Metals									
Arsenic	69	0.00020	7.5	0.74	0.0061	1.0	2.2	**2.2**	
Copper	52	0.0000090	2.1	6.2	0.94	5.6	1.3	0.24	
Lead	997	0.00043	30	13	0.0015	4.7	14	**3.0**	
Zinc	554	0.000071	310	0.00000000020	13	75	80	**1.1**	
Pesticides									
alpha-BHC	0.24	0.00000090	0.34	0.018	0.00054	0.40	0.081	0.20	**37**
beta-BHC	0.24	0.00000090	0.34	0.017	0.0039	0.40	0.082	0.20	
delta-BHC	0.24	0.00000090	0.34	0.011	0.00030	0.40	0.081	0.20	
gamma-BHC (lindane)	0.24	0.00000090	0.34	0.019	0.00025	0.10	0.081	0.81	
4,4'-DDD	0.47	0.000031	0.59	0.00067	0.0010	0.15	0.14	0.97	
4,4'-DDE	0.70	0.000046	0.88	0.0020	0.0010	0.15	0.21	**1.4**	
4,4'-DDT	8.0	0.00052	10	0.016	0.0010	0.15	2.4	**16**	
Dieldrin	0.48	0.0000018	0.67	0.013	0.0010	0.015	0.16	**11**	
S18									
Metals									
Arsenic	28	0.000079	3.0	0.30	0.0061	1.0	0.90	0.87	
Copper	40	0.0000068	1.6	4.7	0.94	5.6	1.1	0.19	
Lead	399	0.00017	12	5.4	0.0015	4.7	5.6	**1.2**	
Zinc	890	0.00011	498	0.00000000032	13	75	126	**1.7**	
Pesticides									
alpha-BHC	2.1	0.0000079	2.9	0.16	0.00054	0.40	0.71	**1.8**	**757**
beta-BHC	0.46	0.0000017	0.64	0.033	0.0039	0.40	0.16	0.39	
delta-BHC	0.024	0.000000090	0.034	0.0011	0.00030	0.40	0.0081	0.020	
gamma-BHC (lindane)	2.1	0.0000079	2.9	0.17	0.00025	0.10	0.71	**7.1**	
4,4'-DDD	10	0.00065	13	0.014	0.0010	0.15	3.0	**21**	
4,4'-DDE	0.72	0.000047	0.91	0.0020	0.0010	0.15	0.22	**1.5**	
4,4'-DDT	340	0.022	428	0.66	0.0010	0.15	102	**697**	
Dieldrin	1.1	0.0000041	1.5	0.030	0.0010	0.015	0.37	**25**	

Table D-13a
Soil and Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]

Notes:
Bolded constituents have a HQ ≥1.0.
Indicates constituent reported as non-detect for medium. The maximum reporting limit used as the EPC.
(a) Tissue EPCs calculated by multiplying the concentration in soil by the tissue-specific BCFs on Table D-10.
(b) Intake for Shrew:

Prepared By/Date: IMR 06/20/18
Checked By/Date: NSR 06/25/18

$$\text{Intake (mg/kg-bw-d)} = SFF*EF*[(NIR_F*[(EPC_I*P_I)+(EPC_V*P_V)+(EPC_M*P_M])+(NIR_S*EPC_S*P_S)+(NIR_W*EPC_W)]$$

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.28
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.30
NIR_S = Normalized Soil Ingestion Rate (kg/kg-bw-d) dry wt.	0.18
EF = Exposure Frequency (unitless)	1
EPC_S = EPC in Soil (mg/kg)	Chemical-specific
P_S = Proportion of Incidential Soil Ingestion (unitless)	0.037
EPC_I = EPC for Invertebrates/Insects (mg/kg)	Chemical-specific
P_I = Proportion of Diet Comprised of Invertebrates/Insects (unitless)	0.78
EPC_v = EPC for Vegetation (mg/kg)	Chemical-specific
P_v = Proportion of Diet Comprised of Vegetation (unitless)	0.14
EPC_M = EPC for Mammals (mg/kg)	Chemical-specific
P_M = Proportion of Diet Comprised of Mammals (unitless)	0.08
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(c) HQ = Intake/TRV
(d) Hazard Index = Sum of HQs for all COPCs
NOAEL = No Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day

Table D-13b
Surface Water Exposure for the Short-Tailed Shrew - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew NOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(a)]	Hazard Quotient (HQ) Unitless[(b)]	Hazard Index (HI) Unitless[(c)]
Metals					
Copper	0.94	5.6	0.26	0.047	0.098
Zinc	13	75	3.5	0.047	
Pesticides					
alpha-BHC	0.00054	0.40	0.00015	0.00038	
beta-BHC	0.0039	0.40	0.0011	0.0027	
delta-BHC	0.00030	0.40	0.000084	0.00021	
gamma-BHC (lindane)	0.00025	0.10	0.000070	0.00070	

Notes:
(a) Intake for Shrew:

Prepared By/Date: IMR 06/13/18
Checked By/Date: NSR 06/25/18

Intake (mg/kg-bw-d) = $SFF*EF*NIR_W*EPC_W$

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.28
EF = Exposure Frequency (unitless)	1
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(b) HQ = Intake/TRV
(c) Hazard Index = Sum of HQs for all COPCs
NOAEL = No Observable Adverse Effects Level
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day

Table D-14a
Soil, Sediment, and Surface Water Exposure for the Racoon - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S) mg/kg dry wt.	Maximum Sediment Concentration (EPC_{SED}) mg/kg dry wt.	Bird Exposure Point Concentration (EPC_B) mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Racoon NOAEL TRV (mg/kg-bw-d)	Racoon Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
Metals										
Arsenic	2,430	51	3.1	267	26	0.0061	1.0	16	**16**	**855**
Copper	2,360		3.0	94	283	0.94	5.6	21	**3.7**	
Lead	78,400	92	100	2,352	1,058	0.0015	4.7	263	**56**	
Zinc	4,730		0.50	2,649	0.0000000017	13	75	123	**1.6**	
Pesticides[c]										
alpha-BHC	1.1	0.054	0.000027	1.5	0.082	0.00054	0.40	0.073	0.18	
beta-BHC	99	0.065	0.0024	139	7.2	0.0039	0.40	6.5	**16**	
delta-BHC	1.9	0.029	0.000047	2.7	0.088	0.00030	0.40	0.12	0.31	
gamma-BHC (lindane)	0.99	0.030	0.000024	1.4	0.080	0.00025	0.10	0.066	0.66	
Chlordane	69	0.062	0.0	96.6	0.3	0.000050	4.6	4.332478	0.95	
4,4'-DDD	27	0.89	0.012	34	0.039	0.0010	0.15	1.5	**10**	
4,4'-DDE	25	0.034	0.011	32	0.070	0.0010	0.15	1.4	**9.6**	
4,4'-DDT	1,600	0.34	0.68	2,016	3.1	0.0010	0.15	91	**616**	
Dieldrin	29	0.088	0.00071	41	0.80	0.0010	0.015	1.9	**124**	

Notes:
Bolded constituents have a HQ ≥1.0.
Indicates constituent reported as non-detect for medium. The reporting limit used as the EPC.
(a) Tissue EPCs calculated by multiplying the concentration in soil by the tissue-specific BCFs on Table D-10.
(b) Intake for Racoon:

$$\text{Intake (mg/kg-bw-d)} = SFF*EF*[(NIR_F*[(EPC_I*P_I)+(EPC_V*P_V)+(EPC_B*P_B])+(NIR_S*EPC_S*P_S*50\%)+(NIRS*EPC_{SED}*P_{SED}*50\%)+(NIR_W*EPC_W)]$$

(c) Maximum concentration of alpha-chlordane or gamma-chlordane used for chlordane.

Prepared By/Date: IMR 06/13/18
Checked By/Date: NSR 06/26/18

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.083
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.093
NIR_S = Normalized Soil/Sediment Ingestion Rate (kg/kg-bw-d) dry wt.	0.030
EF = Exposure Frequency (unitless)	1
$EPC_{S/SED}$ = EPC in Soil/Sediment (mg/kg)	Chemical-specific
$P_{S/SED}$ = Proportion of Incidential Ingestion of Soil/Sediment (unitless)	0.094
EPC_I = EPC for Invertebrates/Insects (mg/kg)	Chemical-specific

Table D-14a
Soil, Sediment, and Surface Water Exposure for the Racoon - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_S) mg/kg dry wt.	Maximum Sediment Concentration (EPC_{SED}) mg/kg dry wt.	Bird Exposure Point Concentration (EPC_B) mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Racoon NOAEL TRV (mg/kg-bw-d)	Racoon Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
P_I = Proportion of Diet Comprised of Invertebrates/Insects (unitless)				0.47						
EPC_v = EPC for Vegetation (mg/kg)				Chemical-specific						
P_v = Proportion of Diet Comprised of Vegetation (unitless)				0.50						
EPC_B = EPC for Birds (mg/kg)				Chemical-specific						
P_B = Proportion of Diet Comprised of Birds (unitless)				0.03						
EPC_W = EPC in Surface Water (mg/L)				Chemical-specific						

(c) HQ = Intake/TRV
(d) Hazard Index = Sum of HQs for all COPCs
NOAEL = No Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day

Table D-14b
Sediment and Surface Water Exposure for the Racoon - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Sediment Concentration (EPC_{SED}), mg/kg dry wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Racoon NOAEL TRV (mg/kg-bw-d)	Racoon Intake (mg/kg-bw-d)[(a)]	Hazard Quotient (HQ) Unitless[(b)]	Hazard Index (HI) Unitless[(c)]
Metals						
Arsenic	51	0.0061	1.0	0.14	0.14	0.22
Copper		0.94	5.6	0.078	0.014	
Zinc		13	75	1.0	0.014	
Pesticides						
alpha-BHC	0.054	0.00054	0.40	0.00020	0.00049	
beta-BHC	0.065	0.0039	0.40	0.00051	0.00127	
delta-BHC	0.029	0.00030	0.40	0.00011	0.00027	
gamma-BHC (lindane)	0.030	0.00025	0.10	0.00011	0.0011	
Chlordane	0.062	0.000050	4.6	0.00018	0.000039	
4,4'-DDD	0.89	0.0010	0.15	0.0026	0.018	
4,4'-DDE	0.034	0.0010	0.15	0.00018	0.00122	
4,4'-DDT	0.34	0.0010	0.15	0.0010	0.0071	
Dieldrin	0.088	0.0010	0.015	0.00033	0.022	

Notes:
Indicates constituent reported as non-detect for medium. The reporting limit used as the EPC.
(a) Intake for Racoon:

Intake (mg/kg-bw-d) = $SFF*EF*[(NIR_S*EPC_{SED}*P_{SED})+(NIR_W*EPC_W)]$

Prepared By/Date: IMR 06/13/18
Checked By/Date: NSR 06/26/18

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.083
NIR_S = Normalized Soil/Sediment Ingestion Rate (kg/kg-bw-d)	0.030
EF = Exposure Frequency (unitless)	1
EPC_{SED} = EPC in Sediment (mg/kg)	Chemical-specific
P_{SED} = Proportion of Incidential Ingestion of Sediment (unitles	0.094
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(h) HQ = Intake/TRV
(i) Hazard Index = Sum of HQs for all COPCs
NOAEL = No Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day

Table D-15a
Soil and Surface Water Exposure for the Northern Bobwhite - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Soil Concentration (EPC_s) mg/kg dry wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Northern Bobwhite NOAEL TRV (mg/kg-bw-d)	Northern Bobwhite Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
Metals								
Arsenic	2,430	267	26	0.0061	2.2	34	**15**	**1,132**
Copper	2,360	94	283	0.94	4.1	109	**27**	
Lead	78,400	2,352	1,058	0.0015	1.6	843	**517**	
Zinc	4,730	2,649	0.0000000017	13	66	164	**2.5**	
Pesticides								
alpha-BHC	1.1	1.5	0.082	0.00054	1.5	0.11	0.076	
beta-BHC	99	139	7.2	0.0039	1.5	10	**6.8**	
delta-BHC	1.9	2.7	0.088	0.00030	1.5	0.18	0.12	
gamma-BHC (lindane)	0.99	1.4	0.080	0.00025	1.5	0.10	0.070	
4,4'-DDD	27	34	0.039	0.0010	0.23	2.0	**8.6**	
4,4'-DDE	25	32	0.070	0.0010	0.23	1.8	**8.0**	
4,4'-DDT	1,600	2,016	3.1	0.0010	0.23	116	**510**	
Dieldrin	29	41	0.80	0.0010	0.071	2.6	**36**	

Notes:
Bolded constituents have a HQ ≥1.0.
Indicates constituent reported as non-detect for medium. The reporting limit used as the EPC.
(a) Tissue EPCs calculated by multiplying the concentration in soil by the tissue-specific BCFs on Table D-10.
(b) Intake for Northern Bobwhite:

Prepared By/Date: IMR 06/13/18
Checked By/Date: NSR 06/26/18

$$\text{Intake (mg/kg-bw-d)} = SFF*EF*[(NIR_F*[(EPC_I*P_I)+(EPC_V*P_V)])+(NIR_S*EPC_S*P_S)+(NIR_W*EPC_W)]$$

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.020
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.38
NIR_S = Normalized Soil Ingestion Rate (kg/kg-bw-d) dry wt.	0.051
EF = Exposure Frequency (unitless)	1
EPC_S = EPC in Soil (mg/kg)	Chemical-specific
P_S = Proportion of Incidential Soil Ingestion (unitless)	0.093
EPC_I = EPC for Invertebrates/Insects (mg/kg)	Chemical-specific
P_I = Proportion of Diet Comprised of Invertebrates/Insects (uni	0.14
EPC_v = EPC for Vegetation (mg/kg)	Chemical-specific
P_v = Proportion of Diet Comprised of Vegetation (unitless)	0.86
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(c) HQ = Intake/TRV
(d) Hazard Index = Sum of HQs for all COPCs
NOAEL = No Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day

Table D-15b
Surface Water Exposure for the Northern Bobwhite - NOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	Maximum Surface Water Exposure Point Concentration (EPC_W), mg/L	Northern Bobwhite NOAEL TRV (mg/kg-bw-d)	Northern Bobwhite Intake (mg/kg-bw-d)[(a)]	Hazard Quotient (HQ) Unitless[(b)]	Hazard Index (HI) Unitless[(c)]
Metals					
Copper	0.94	4.1	0.019	0.0046	0.0085
Zinc	13	66	0.25	0.0038	
Pesticides					
alpha-BHC	0.00054	1.5	0.000011	0.0000072	
beta-BHC	0.0039	1.5	0.000078	0.000052	
delta-BHC	0.00030	1.5	0.0000060	0.0000040	
gamma-BHC (lindane)	0.00025	1.5	0.0000050	0.0000033	

Notes:
(a) Intake for Northern Bobwhite:

Intake (mg/kg-bw-d) = $SFF*EF*NIR_W*EPC_W$

Prepared By/Date: IMR 06/13/18
Checked By/Date: NSR 06/26/18

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.02
EF = Exposure Frequency (unitless)	1
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(b) HQ = Intake/TRV

(c) Hazard Index = Sum of HQs for all COPCs

NOAEL = No Observable Adverse Effects Level

mg/L = milligrams per liter

mg/kg-bw-d = milligrams per kilogram body weight per day

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[a] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[a] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[a] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[b]	Hazard Quotient (HQ) Unitless[c]	Hazard Index (HI) Unitless[d]
S01									
Metals									
Arsenic	1,088	0.0031	120	12	0.0061	4.6	36	**7.8**	
Copper	1,492	0.00026	60	179	0.30	83	31	0.38	
Lead	7,990	0.0035	240	108	0.00076	80	112	**1.4**	
Zinc	2,635	0.00034	1,476	0.00000000095	4.7	298	364	**1.2**	
									12
Pesticides									
4,4'-DDE	0.65	0.000042	0.81	0.0018	0.00050	4.6	0.19	0.042	
4,4'-DDT	3.5	0.00023	4.4	0.0069	0.00050	4.6	1.1	0.23	
Dieldrin	2.1	0.0000079	2.9	0.058	0.00050	1.3	0.70	0.55	
S02									
Metals									
Arsenic	2,430	0.0070	267	26	0.0061	4.6	79	**17**	
Copper	389	0.000067	16	47	0.30	83	8.2	0.099	
Lead	8,268	0.0036	248	112	0.00076	80	116	**1.5**	
Zinc	647	0.000084	363	0.00000000023	4.7	298	90	0.30	
Pesticides									
beta-BHC	99	0.00037	139	7.2	0.0016	2.0	33	**17**	**56**
delta-BHC	1.9	0.0000071	2.7	0.088	0.00018	2.0	0.64	0.32	
gamma-BHC (lindane)	0.99	0.0000037	1.4	0.080	0.00012	1.0	0.33	0.33	
4,4'-DDD	15	0.00098	19	0.021	0.00050	4.6	4.5	0.98	
4,4'-DDE	5.9	0.00038	7.4	0.017	0.00050	4.6	1.8	0.38	
4,4'-DDT	280	0.018	353	0.55	0.00050	4.6	84	**18**	
Dieldrin	0.56	0.0000021	0.78	0.015	0.00050	1.3	0.19	0.15	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S03									
Metals									
Arsenic	141	0.00041	15	1.5	0.0061	4.6	4.6	**1.0**	
Copper	415	0.000072	17	50	0.30	83	8.7	0.11	
Lead	45,100	0.019	1,353	609	0.00076	80	634	**7.9**	
Zinc	2,335	0.00030	1,308	0.00000000084	4.7	298	322	**1.1**	
									11.2
Pesticides									
4,4'-DDE	0.93	0.000061	1.2	0.0026	0.00050	4.6	0.28	0.061	
4,4'-DDT	14	0.00093	18	0.028	0.00050	4.6	4.3	0.93	
Dieldrin	0.34	0.0000013	0.48	0.0094	0.00050	1.3	0.11	0.090	
S04									
Metals									
Arsenic	410	0.0012	45	4.4	0.0061	4.6	13	**2.9**	
Copper	844	0.00015	34	101	0.30	83	18	0.21	
Lead	8,833	0.0038	265	119	0.00076	80	124	**1.6**	
Zinc	1,099	0.00014	615	0.00000000040	4.7	298	152	0.51	
									7.2
Pesticides									
4,4'-DDE	1.8	0.00012	2.3	0.0051	0.00050	4.6	0.55	0.12	
4,4'-DDT	6.0	0.00039	7.6	0.012	0.00050	4.6	1.8	0.39	
Dieldrin	5.8	0.000022	8.1	0.16	0.00050	1.3	1.9	**1.5**	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S05									
Metals									
Arsenic	48	0.00014	5.2	0.51	0.0061	4.6	1.6	0.34	
Copper	292	0.000050	12	35	0.30	83	6.2	0.074	
Lead	1,062	0.00046	32	14	0.00076	80	15	0.19	
Zinc	941	0.00012	527	0.00000000034	4.7	298	131	0.44	
									1.6
Pesticides									
4,4'-DDE	1.2	0.000079	1.5	0.0034	0.00050	4.6	0.37	0.079	
4,4'-DDT	4.9	0.00032	6.2	0.0095	0.00050	4.6	1.5	0.32	
Dieldrin	0.47	0.0000018	0.66	0.013	0.00050	1.3	0.16	0.12	
S06									
Metals									
Arsenic	322	0.00093	35	3.5	0.0061	4.6	11	**2.3**	
Copper	1,827	0.00032	73	219	0.30	83	38	0.46	
Lead	2,471	0.0011	74	33	0.00076	80	35	0.43	
Zinc	3,741	0.00048	2,095	0.0000000013	4.7	298	516	**1.7**	
									5.7
Pesticides									
4,4'-DDD	2.5	0.00016	3.2	0.0036	0.00050	4.6	0.75	0.16	
4,4'-DDE	1.5	0.000099	1.9	0.0043	0.00050	4.6	0.46	0.099	
4,4'-DDT	5.0	0.00033	6.3	0.0098	0.00050	4.6	1.5	0.33	
Dieldrin	0.81	0.0000030	1.1	0.022	0.00050	1.3	0.27	0.21	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[a] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[a] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[a] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[b]	Hazard Quotient (HQ) Unitless[c]	Hazard Index (HI) Unitless[d]
S07									
Metals									
Arsenic	61	0.00018	6.7	0.66	0.0061	4.6	2.0	0.44	
Copper	254	0.000044	10	31	0.30	83	5.4	0.065	
Lead	647	0.00028	19	8.7	0.00076	80	9.1	0.11	
Zinc	953	0.00012	533	0.00000000034	4.7	298	132	0.44	
Pesticides									
alpha-BHC	1.9	0.0000071	2.7	0.14	0.00027	2.0	0.64	0.32	**22**
beta-BHC	31	0.00012	43	2.3	0.0016	2.0	10	**5.2**	
delta-BHC	1.9	0.0000071	2.7	0.088	0.00018	2.0	0.64	0.32	
gamma-BHC (lindane)	1.9	0.0000071	2.7	0.15	0.00012	1.0	0.64	0.64	
4,4'-DDE	0.95	0.000062	1.2	0.0027	0.00050	4.6	0.29	0.062	
4,4'-DDT	130	0.0085	164	0.25	0.00050	4.6	39	**8.5**	
Dieldrin	24	0.000090	34	0.66	0.00050	1.3	8.0	**6.3**	
S08									
Metals									
Arsenic	118	0.00034	13	1.3	0.0061	4.6	3.9	0.85	
Copper	769	0.00013	31	92	0.30	83	16	0.19	
Lead	682	0.00029	20	9.2	0.00076	80	9.6	0.12	
Zinc	3,328	0.00043	1,864	0.0000000012	4.7	298	459	**1.5**	**3.1**
Pesticides									
4,4'-DDE	1.0	0.000066	1.3	0.0028	0.00050	4.6	0.30	0.066	
4,4'-DDT	3.0	0.00019	3.8	0.0058	0.00050	4.6	0.90	0.19	
Dieldrin	0.53	0.0000020	0.74	0.015	0.00050	1.3	0.18	0.14	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S09									
Metals									
Arsenic	168	0.00048	19	1.8	0.0061	4.6	5.5	**1.2**	
Copper	384	0.000066	15	46	0.30	83	8.1	0.098	
Lead	1,835	0.00079	55	25	0.00076	80	26	0.32	
Zinc	651	0.000084	365	0.00000000023	4.7	298	91	0.30	
Pesticides									
beta-BHC	56	0.00021	78	4.1	0.0016	2.0	19	**9.4**	**127**
delta-BHC	2.5	0.0000092	3.4	0.11	0.00018	2.0	0.82	0.41	
gamma-BHC (lindane)	0.44	0.0000016	0.62	0.036	0.00012	1.0	0.15	0.15	
4,4'-DDD	27	0.0018	34	0.039	0.00050	4.6	8.1	**1.8**	
4,4'-DDE	25	0.0016	32	0.070	0.00050	4.6	7.5	**1.6**	
4,4'-DDT	1,600	0.10	2,016	3.1	0.00050	4.6	482	**104**	
Dieldrin	29	0.00011	41	0.80	0.00050	1.3	9.7	**7.7**	
S10									
Metals									
Copper	629	0.00011	25	75	0.30	83	13	0.16	
Lead	1,378	0.00060	41	19	0.00076	80	19	0.24	
Zinc	524	0.000068	293	0.00000000019	4.7	298	73	0.25	
Pesticides									0.82
4,4'-DDE	0.67	0.000044	0.84	0.0019	0.00050	4.6	0.20	0.044	
4,4'-DDT	0.99	0.000064	1.2	0.0019	0.00050	4.6	0.30	0.064	
Dieldrin	0.24	0.00000088	0.33	0.0065	0.00050	1.3	0.079	0.062	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S11									
Metals									
Arsenic	49	0.00014	5.4	0.53	0.0061	4.6	1.6	0.35	
Lead	343	0.00015	10	4.6	0.00076	80	4.8	0.060	
Zinc	454	0.000059	254	0.00000000016	4.7	298	64	0.21	
Pesticides									**2.1**
4,4'-DDD	0.51	0.000033	0.64	0.00073	0.00050	4.6	0.15	0.033	
4,4'-DDE	1.4	0.000093	1.8	0.0040	0.00050	4.6	0.43	0.093	
4,4'-DDT	19	0.0012	24	0.037	0.00050	4.6	5.7	**1.2**	
Dieldrin	0.35	0.0000013	0.49	0.0096	0.00050	1.3	0.12	0.092	
S12									
Metals									
Arsenic	219	0.00063	24	2.4	0.0061	4.6	7.1	**1.6**	
Copper	360	0.000062	14	43	0.30	83	7.6	0.091	
Lead	1,371	0.00059	41	19	0.00076	80	19	0.24	
Zinc	669	0.000086	375	0.00000000024	4.7	298	93	0.31	
Pesticides									**3.1**
4,4'-DDD	0.88	0.000057	1.1	0.0013	0.00050	4.6	0.27	0.057	
4,4'-DDE	1.0	0.000065	1.3	0.0028	0.00050	4.6	0.30	0.065	
4,4'-DDT	7.5	0.00049	9.5	0.015	0.00050	4.6	2.3	0.49	
Dieldrin	0.90	0.0000034	1.3	0.025	0.00050	1.3	0.30	0.24	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S13									
Metals									
Arsenic	386	0.0011	42	4.2	0.0061	4.6	13	**2.8**	
Copper	352	0.000061	14	42	0.30	83	7.4	0.090	
Lead	10,647	0.0046	319	144	0.00076	80	150	**1.9**	
Zinc	872	0.00011	488	0.00000000031	4.7	298	121	0.41	
Pesticides									**79**
alpha-BHC	1.2	0.0000043	1.6	0.085	0.00027	2.0	0.39	0.19	
4,4'-DDD	22	0.0014	28	0.031	0.00050	4.6	6.6	**1.4**	
4,4'-DDE	1.6	0.00010	2.0	0.0045	0.00050	4.6	0.48	0.10	
4,4'-DDT	1,100	0.072	1,386	2.1	0.00050	4.6	332	**72**	
Dieldrin	1.0	0.0000037	1.4	0.027	0.00050	1.3	0.34	0.26	
S14									
Metals									
Arsenic	49	0.00014	5.4	0.53	0.0061	4.6	1.6	0.35	
Lead	748	0.00032	22	10	0.00076	80	11	0.13	
Zinc	508	0.000065	284	0.00000000018	4.7	298	71	0.24	
Pesticides									0.78
4,4'-DDE	0.68	0.000044	0.86	0.0019	0.00050	4.6	0.21	0.044	
Dieldrin	0.042	0.00000016	0.059	0.0012	0.00050	1.3	0.014	0.011	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S15									
Metals									
Arsenic	557	0.0016	61	6.0	0.0061	4.6	18	**4.0**	
Copper	708	0.00012	28	85	0.30	83	15	0.18	
Lead	65,600	0.028	1,968	886	0.00076	80	922	**12**	
Zinc	1,373	0.00018	769	0.00000000049	4.7	298	190	0.64	**16.4**
Pesticides									
4,4'-DDE	0.28	0.000018	0.35	0.00078	0.00050	4.6	0.084	0.018	
Dieldrin	0.15	0.00000056	0.21	0.0041	0.00050	1.3	0.050	0.040	
S16									
Metals									
Arsenic	136	0.00039	15	1.5	0.0061	4.6	4.4	0.98	
Lead	78,400	0.034	2,352	1,058	0.00076	80	1,102	**14**	
Zinc	496	0.000064	278	0.00000000018	4.7	298	69	0.23	
Pesticides									**20**
4,4'-DDD	0.77	0.000050	0.97	0.0011	0.00050	4.6	0.23	0.050	
4,4'-DDE	0.67	0.000043	0.84	0.0019	0.00050	4.6	0.20	0.043	
4,4'-DDT	17	0.0011	21	0.033	0.00050	4.6	5.1	**1.1**	
Dieldrin	15	0.000056	21	0.41	0.00050	1.3	5.0	**4.0**	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
S17									
Metals									
Arsenic	36	0.00010	3.9	0.39	0.0061	4.6	1.2	0.26	
Lead	681	0.00029	20	9.2	0.00076	80	9.6	0.12	
Zinc	511	0.000066	286	0.00000000018	4.7	298	72	0.24	
									1.2
Pesticides									
4,4'-DDE	0.70	0.000046	0.88	0.0020	0.00050	4.6	0.21	0.046	
4,4'-DDT	8.0	0.00052	10	0.016	0.00050	4.6	2.4	0.52	
Dieldrin	0.24	0.00000090	0.34	0.0066	0.00050	1.3	0.081	0.063	
S18									
Metals									
Lead	249	0.00011	7.5	3.4	0.00076	80	3.5	0.044	
Zinc	687	0.000089	385	0.00000000025	4.7	298	96	0.32	
Pesticides									
alpha-BHC	1.1	0.0000039	1.5	0.078	0.00027	2.0	0.35	0.18	**9.8**
gamma-BHC (lindane)	1.1	0.0000039	1.5	0.085	0.00012	1.0	0.35	0.35	
4,4'-DDD	10	0.00065	13	0.014	0.00050	4.6	3.0	0.65	
4,4'-DDE	0.32	0.000021	0.41	0.00091	0.00050	4.6	0.097	0.021	
4,4'-DDT	121	0.0079	153	0.24	0.00050	4.6	37	**7.9**	
Dieldrin	1.1	0.0000041	1.5	0.030	0.00050	1.3	0.37	0.29	

Table D-16
Soil and Surface Water Exposure for the Short-Tailed Shrew - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S), mg/kg dry wt.	Mammal Exposure Point Concentration (EPC_M), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Shrew LOAEL TRV (mg/kg-bw-d)	Shrew Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]

Notes:
Bolded constituents have a HQ ≥1.0.
Indicates constituent reported as non-detect for medium. 1/2 the reporting limit used as the EPC.
(a) Tissue EPCs calculated by multiplying the concentration in soil by the tissue-specific BCFs on Table D-10.
(b) Intake for Shrew:

Prepared By/Date: LO 07/25/18
Checked By/Date: IMR 07/25/18

$$\text{Intake (mg/kg-bw-d)} = SFF*EF*[(NIR_F*[(EPC_I*P_I)+(EPC_V*P_V)+(EPC_M*P_M)])+(NIR_S*EPC_S*P_S)+(NIR_W*EPC_W)]$$

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.28
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.30
NIR_S = Normalized Soil Ingestion Rate (kg/kg-bw-d) dry wt.	0.18
EF = Exposure Frequency (unitless)	1
EPC_S = EPC in Soil (mg/kg)	Chemical-specific
P_S = Proportion of Incidential Soil Ingestion (unitless)	0.037
EPC_I = EPC for Invertebrates/Insects (mg/kg)	Chemical-specific
P_I = Proportion of Diet Comprised of Invertebrates/Insects (unitless)	0.78
EPC_V = EPC for Vegetation (mg/kg)	Chemical-specific
P_V = Proportion of Diet Comprised of Vegetation (unitless)	0.14
EPC_M = EPC for Mammals (mg/kg)	Chemical-specific
P_M = Proportion of Diet Comprised of Mammals (unitless)	0.08
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(c) HQ = Intake/TRV
(d) Hazard Index = Sum of HQs for all COPCs
LOAEL = Lowest Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day
95% UCL = 95 percent upper confidence limit

Table D-17
Soil, Sediment, and Surface Water Exposure for the Racoon - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_S) mg/kg dry wt.	95% UCL Sediment Concentration (EPC_{SED}) mg/kg dry wt.	Bird Exposure Point Concentration (EPC_B), mg/kg[(a)] wet wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCL Surface Water Exposure Point Concentration (EPC_W), mg/L	Racoon LOAEL TRV (mg/kg-bw-d)	Racoon Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
Metals										
Arsenic	163	51	0.21	18	1.8	0.0061	4.6	1.2	0.26	**1.3**
Copper	328		0.42	13	39	0.30	83	2.9	0.035	
Lead	3,039	71	3.9	91	41	0.00076	80	10	0.129	
Zinc	652		0.068	365	0.00000000023	4.7	298	17	0.058	
Pesticides										
beta-BHC	0.75	0.040	0.000018	1.1	0.055	0.0016	2.0	0.050	0.025	
4,4'-DDD	1.8	0.89	0.00078	2.3	0.0026	0.00050	4.6	0.10	0.022	
4,4'-DDE	2.2	0.020	0.00093	2.7	0.0061	0.00050	4.6	0.12	0.027	
4,4'-DDT	60	0.19	0.026	76	0.12	0.00050	4.6	3.4	0.74	
Dieldrin	0.65	0.088	0.000016	0.90	0.018	0.00050	1.3	0.041	0.033	

Notes:
Indicates constituent reported as non-detect for medium. The reporting limit used as the EPC.
(a) Tissue EPCs calculated by multiplying the concentration in soil by the tissue-specific BCFs on Table D-10.
(b) Intake for Racoon:

Prepared By/Date: LO 07/25/18
Checked By/Date: IMR 07/25/18

$$\text{Intake (mg/kg-bw-d)} = SFF*EF*[(NIR_F*[(EPC_I*P_I)+(EPC_V*P_V)+(EPC_B*P_B])+(NIR_S*EPC_S*P_S*50\%)+(NIRS*EPC_{SED}*P_{SED}*50\%)+(NIR_W*EPC_W)]$$

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.083
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.093
NIR_S = Normalized Soil/Sediment Ingestion Rate (kg/kg-bw-d) dry wt.	0.030
EF = Exposure Frequency (unitless)	1

$EPC_{S/SED}$ = EPC in Soil/Sediment (mg/kg)	Chemical-specific
$P_{S/SED}$ = Proportion of Incidential Ingestion of Soil/Sediment (unitless)	0.094
EPC_I = EPC for Invertebrates/Insects (mg/kg)	Chemical-specific
P_I = Proportion of Diet Comprised of Invertebrates/Insects (unitless)	0.47
EPC_v = EPC for Vegetation (mg/kg)	Chemical-specific
P_v = Proportion of Diet Comprised of Vegetation (unitless)	0.50
EPC_B = EPC for Birds (mg/kg)	Chemical-specific
P_B = Proportion of Diet Comprised of Birds (unitless)	0.03
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(c) HQ = Intake/TRV
(d) Hazard Index = Sum of HQs for all COPCs
LOAEL = Lowest Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day
95% UCL = 95 percent upper confidence limit

Table D-18
Soil and Surface Water Exposure for the Northern Bobwhite - LOAEL Analysis
Former Estech Chemicals Site
Atlanta, GA

Constituent	95% UCL Soil Concentration (EPC_s) mg/kg dry wt.	Invertebrate Exposure Point Concentration (EPC_I), mg/kg[(a)] wet wt.	Vegetation Exposure Point Concentration (EPC_V), mg/kg[(a)] wet wt.	95% UCLSurface Water Exposure Point Concentration (EPC_W), mg/L	Northern Bobwhite LOAEL TRV (mg/kg-bw-d)	Northern Bobwhite Intake (mg/kg-bw-d)[(b)]	Hazard Quotient (HQ) Unitless[(c)]	Hazard Index (HI) Unitless[(d)]
Metals								
Arsenic	163	18	1.8	0.0061	4.5	2.3	0.51	**5.4**
Copper	328	13	39	0.30	35	15	0.43	
Lead	3,039	91	41	0.00076	11	33	**2.9**	
Zinc	652	365	0.00000000023	4.7	170	23	0.13	
Pesticides								
beta-BHC	0.75	1.1	0.055	0.0016	4.5	0.078	0.017	
4,4'-DDD	1.8	2.3	0.0026	0.00050	3.5	0.13	0.038	
4,4'-DDE	2.2	2.7	0.0061	0.00050	3.5	0.16	0.045	
4,4'-DDT	60	76	0.12	0.00050	3.5	4.4	**1.3**	
Dieldrin	0.65	0.90	0.018	0.00050	0.80	0.057	0.071	

Notes:
Bolded constituents have a HQ ≥1.0.
Indicates constituent reported as non-detect for medium. The 1/2 the reporting limit used as the EPC.
(a) Tissue EPCs calculated by multiplying the concentration in soil by the tissue-specific BCFs on Table D-10.
(b) Intake for Northern Bobwhite:

Prepared By/Date: LO 07/25/18
Checked By/Date: IMR 07/25/18

Intake (mg/kg-bw-d) = $SFF*EF*[(NIR_F*[(EPC_I*P_I)+(EPC_V*P_V)])+(NIR_S*EPC_S*P_S)+(NIR_W*EPC_W)]$

Where:

SFF = Site Foraging Frequency	1
NIR_W = Normalized Water Ingestion Rate (kg/L-bw-d)	0.020
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.38
NIR_S = Normalized Soil Ingestion Rate (kg/kg-bw-d) dry wt.	0.051
EF = Exposure Frequency (unitless)	1
EPC_S = EPC in Soil (mg/kg)	Chemical-specific
P_S = Proportion of Incidential Soil Ingestion (unitless)	0.093
EPC_I = EPC for Invertebrates/Insects (mg/kg)	Chemical-specific
P_I = Proportion of Diet Comprised of Invertebrates/Insects (u	0.14
EPC_v = EPC for Vegetation (mg/kg)	Chemical-specific
P_v = Proportion of Diet Comprised of Vegetation (unitless)	0.86
EPC_W = EPC in Surface Water (mg/L)	Chemical-specific

(c) HQ = Intake/TRV
(d) Hazard Index = Sum of HQs for all COPCs
LOAEL = Lowest Observable Adverse Effects Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mg/kg-bw-d = milligrams per kilogram body weight per day
95% UCL = 95 percent upper confidence limit

Table D-19
Summary of Ecological Hazard Indices
Former Estech Chemicals Site
Atlanta, GA

Ecological Receptor	COPC	Media	Exposure Unit	NOAEL HI	LOAEL HI
Short-tailed Shrew	Metals & Pesticides	SO & SW	S01	**126**	**12**
			S02	**829**	**56**
			S03	**204**	**11**
			S04	**237**	**7.2**
			S05	**49**	**1.6**
			S06	**108**	**5.7**
			S07	**862**	**22**
			S08	**47**	**3.1**
			S09	**4,113**	**127**
			S10	**27**	0.82
			S11	**61**	**2.1**
			S12	**86**	**3.1**
			S13	**2,385**	**79**
			S14	**11**	0.78
			S15	**248**	**16**
			S16	**620**	**20**
			S17	**37**	**1.2**
			S18	**757**	**9.8**
		SW	Site-Wide	0.098	--
Racoon	Metals & Pesticides	SO, SED, & SW	Site-Wide	**855**	**1.3**
		SED & SW	Site-Wide	0.22	--
Northern Bobwhite	Metals & Pesticides	SO & SW	Site-Wide	**1,132**	**5.4**
		SW	Site-Wide	0.0085	--

Notes:
Bolded value indicates a Hazard Index (HI) ≥ 1.0
COPC = Chemical of Potential Concern
HI = Hazard Index
LOAEL = Lowest Observable Adverse Effects Level
NOAEL = No Observable Adverse Effects Level
SW = Surface Water
SO = Soil
SED = Sediment
-- = Not applicable

Prepared by/Date: LO 07/25/18
Checked By/Date: IMR 07/25/18

Table D-20
Surface Soil Preliminary Remedial Goal Calculations
Former Estech Chemicals Site
Atlanta, GA

Constituent	NOAEL TRV (mg/kg-bw-d)	LOAEL TRV (mg/kg-bw-d)	NOAEL PRG[(a)] (mg/kg)	LOAEL PRG[(a)] (mg/kg)
1-Acre Exposure Area Mammal PRGs - Shrew[(a)]				
Metals				
Arsenic	1.0	4.6	32	**139**
Lead	4.7	80	334	**5,692**
Zinc	75	298	548	**2,167**
Pesticides				
beta-BHC	0.40	2.0	1.2	**5.9**
4,4'-DDD	0.15	4.6	0.49	**15**
4,4'-DDE	0.15	4.6	0.49	**15**
4,4'-DDT	0.15	4.6	0.49	**15**
Dieldrin	0.015	1.3	0.045	**3.8**
Site-Wide Mammal PRGs - Racoon[(a,b)]				
Metals				
Arsenic	1.0	4.6	128	559
Pesticides				
4,4'-DDT	0.15	4.6	2.5	80
Site-Wide Avian PRGs - Northern Bobwhite[(a,c,d)]				
Metals				
Arsenic	2.2	4.5	159	**319**
Lead	1.6	11	152	**1,051**
Pesticides				
4,4'-DDT	0.23	3.5	3.1	**48**

Notes:
PRGs are calculated for those COPCs with LOAEL HQs above 1, unless otherwise noted.
Bolded PRGs used in comparison to 1-acre exposure area or site-wide surface soil 95% UCL concentrations.
(a) PRG for mammals/birds:

Prepared By/Date: LO 07/25/18
Checked By/Date: IMR 07/25/18

$$PRG\ (mg/kg) = \frac{(TRV*THQ)}{[SFF*EF*[(NIR_F*[(BCF_I*P_I)+(BCF_V*P_V)+(BCF_M*P_M)+(BCF_B*P_B)])+(NIR_S*P_S)]}$$

Where:	Shrew	Racoon	Bobwhite
SFF = Site Foraging Frequency	1	1	1
NIR_F = Normalized Food Ingestion Rate (kg/kg-bw-d) wet wt.	0.30	0.093	0.38
NIR_S = Normalized Soil/Sediment Ingestion Rate (kg/kg-bw-d) dry wt.	0.18	0.030	0.051
EF = Exposure Frequency (unitless)	1	1	1
THQ = Target Hazard Quotient	1	1	1
P_S = Proportion of Incidential Soil/Sediment Ingestion (unitless)	0.037	0.094	0.093
P_I = Proportion of Diet Comprised of Invertebrates/Insects (unitless)	0.78	0.47	0.14
P_v = Proportion of Diet Comprised of Vegetation (unitless)	0.14	0.50	0.86
P_M = Proportion of Diet Comprised of Mammals (unitless)	0.08	0	0
P_B = Proportion of Diet Comprised of Birds (unitless)	0	0.03	0

(b) Although arsenic and 4,4-DDT LOAEL HQs were below 1 for the raccoon, PRGs were calculated because they are primary contributors to the overall LOAEL HI above 1.
(c) Although arsenic and lead LOAEL HQs were below 1 for the northern bobwhite, PRGs were calculated because they are primary contributors to the overall LOAEL HI above 1.
(d) The lower of the site-wide PRGs for the raccoon or bobwhite were used in the comparison to site-wide surface soil 95% UCL concentrations.
NOAEL = No Observable Adverse Effects Level
LOAEL = Lowest Observable Adverse Effects Level
TRV = Toxicity Reference Value
PRG = Preliminary Remedial Goal
mg/kg = milligrams per kilogram
mg/kg-bw-d = milligrams per kilogram body weight per day

Prepared By/Date: IMR 06/26/18
Checked By/Date: NSR 06/28/18

Table D-21
Comparison of Post Corrective Action Surface Soil Exposure Point Concentrations to Preliminary Remediation Goals
Former Estech Chemical Site
Atlanta, GA

Receptor	Exposure Unit	Constituent Group	Constituent	Post Corrective Action EPC[a]	Post Corrective Action EPC Statistic	LOAEL PRG[b,c]
Short-tailed Shrew	S01	Metals	Arsenic	46	95% KM (t) UCL	139
			Lead	532	95% Student's-t UCL	5,692
			Zinc	492	Maximum[e]	2,167
	S02	Metals	Arsenic	109	Maximum[f]	139
			Lead	1,190	Maximum[f]	5,692
		Pesticides	beta-BHC	0.025	Reporting Limit[d]	5.9
			4,4'-DDT	0.055	Maximum[f]	15
	S03	Metals	Arsenic	86	95% Student's-t UCL	139
			Lead	1,304	95% Student's-t UCL	5,692
			Zinc	841	95% Student's-t UCL	2,167
	S04	Metals	Arsenic	120	Maximum[f]	139
			Lead	1,730	Maximum[f]	5,692
	S05	Existing surface soil EPCs below respective LOAEL PRGs				
	S06	Metals	Arsenic	39	Maximum[f]	139
			Zinc	583	Maximum[f]	2,167
	S07	Pesticides	beta-BHC	0.84	Maximum[f]	5.9
			4,4'-DDT	3.3	95% Student's-t UCL	15
			Dieldrin	1.3	Maximum[f]	3.8
	S08	Metals	Zinc	623	95% Student's-t UCL	2,167
	S09	Metals	Arsenic	91	Maximum[f]	139
		Pesticides	beta-BHC	0.93	Maximum[f]	5.9
			4,4'-DDD	0.69	Maximum[f]	15
			4,4'-DDE	1.0	Maximum[e]	15
			4,4'-DDT	11	95% Student's-t UCL	15
			Dieldrin	1.3	Maximum[f]	3.8
	S10	Existing surface soil EPCs below respective LOAEL PRGs				
	S11	Pesticides	4,4'-DDT	1.3	95% Student's-t UCL	15
	S12	Metals	Arsenic	106	Maximum[f]	139
	S13	Metals	Arsenic	57	95% KM (t) UCL	139
			Lead	1,488	95% Student's-t UCL	5,692
		Pesticides	4,4'-DDD	0.94	Maximum[f]	15
			4,4'-DDT	11	Maximum[e]	15
	S14	Existing surface soil EPCs below respective LOAEL PRGs				
	S15	Metals	Arsenic	135	Maximum[f]	139
			Lead	3,740	Maximum[f]	5,692
	S16	Metals	Lead	3,275	95% Student's-t UCL	5,692
		Pesticides	4,4'-DDT	0.71	95% KM (t) UCL	15
	S17	Existing surface soil EPCs below respective LOAEL PRGs				
	S18	Pesticides	4,4'-DDT	6.5	Maximum[f]	15

Table D-21
Comparison of Post Corrective Action Surface Soil Exposure Point Concentrations to Preliminary Remediation Goals
Former Estech Chemical Site
Atlanta, GA

Receptor	Exposure Unit	Constituent Group	Constituent	Post Corrective Action EPC[(a)]	Post Corrective Action EPC Statistic	LOAEL PRG[(b,c)]
Racoon	Site-wide	Existing surface soil EPCs below respective LOAEL PRGs				
Northern Bobwhite	Site-wide	Metals	Lead	1,005	95% Chebyshev (Mean, Sd) UCL	1,051
		Pesticides	4,4'-DDT	40	95% KM H-UCL	48

Notes:

a) Exposure point concentrations based on cumulative remaining soil sampling locations. Select soil samples removed to achive a 95% upper confidence limit of the mean (UCL) or a maximum detected concentration below respective lowest adverse effect level (LOAEL) preliminary remedial goals (PRGs). Units in milligram per kilogram (mg/kg).

b) Refer to Table D-20 for additional details on PRG calculations; units in mg/kg

c) COPCs with current EPCs less than applicable respective LOAEL PRGs for a given receptor and exposure unit are not presented.

d) No detected concentrations in remaining soil sample locations.

e) ProUCL suggested UCL exceeds maximum detected concentration.

f) For constituents with < 4 detections, the maximum detected concentration was used for the EPC.

Prepared by/date: LO 07/25/18
Checked by/date: IMR 07/25/18

Figures

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SW-2010-17
SW-2010-15
SED-105
SW-2010-14
SW-2010-11
Main Point
SED-104
SW-2014-20
SW-2010-10
SW-2014-21
SED-103
SW-2010-5
SED-102
SED-101

D1 E2 D2 E3 F3 F4 D3 E4 F5 C3 D4 E5 F6 C4 D5 E6 F7 C5 D6 E7 F8 C6 D7 E8 F9 C7 D8 E9 C8 D9 E10 F10 D10 F11 C9 E11 F12 C10 D11 E12 F13 B10 D12 E13 F14 C11 B11 C12 D13 E14 F15 B12 C13 D14 E15 F16 C14 D15 E16 F17 C15 D16 E17 F18 C16 D17 E18 F19 C17 D18 E19 F20 C18 D19 E20 F21 C19 D20 E21 C20 D21 E22 F22 C21 D22 E23 F23 F24 C22 D23 E24 B22 C23 D24 F25 E25 A22 B23 C24 D25 F26 E26 B24 A23 C25 D26 E27 F27 A24 B25 C26 D27 F28 E28 A25 B26 C27 D28 E29 F29 A26 B27 C28 D29 E30 F30 B28 C29 D30 F31 E31 F32 B29 C30 D31 E32 C31 D32 E33 C32 D33 E34 D34 E35

Legend

- 2018 Soil Location
- 2000/2004 Sediment Location
- 2016-2018 Surface Water Location
- Tax Parcel Boundary

0 200 400 Feet

Former Estech General Chemical Site
Atlanta, Georgia

Sampling Locations used in the Ecological Risk Assessment

Prepared by/Date: JRM - 6/29/2018	
Checked by/Date: LO - 6/29/2018	
Project Number: 6122080154	wood.

Figure Number: D-1

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S01 S02 S03 S04 S05 S06 S07 S08 S09 S10 S11 S12 S13 S14 S15 S16 S17 S18

D1 E2 F3 D2 E3 F4 D3 F5 C3 D4 E5 F6 C4 D5 E6 F7 C5 D6 E7 F8 C6 D7 E8 F9 C7 D8 E9 F10 C8 D9 E10 F11 C9 D10 E11 F12 C10 D11 E12 F13 B10 C11 D12 E13 F14 B11 C12 D13 E14 F15 B12 C13 D14 E15 F16 C14 D15 E16 F17 C15 D16 E17 F18 C16 D17 E18 F19 C17 D18 E19 F20 C18 D19 E20 F21 C19 D20 E21 F22 C20 D21 E22 F23 C21 D22 E23 F24 C22 D23 E24 F25 B22 C23 D24 E25 F26 A22 B23 C24 D25 E26 F27 A23 B24 C25 D26 E27 F28 A24 B25 C26 D27 E28 F29 A25 B26 C27 D28 E29 F30 A26 B27 C28 D29 E30 F31 B28 C29 D30 E31 F32 B29 C30 D31 E32 C31 D32 E33 C32 D33 E34 D34 E35

Legend

- 2018 Soil Location
- Exposure Areas for Short-tailed Shrew
- Tax Parcel Boundary

0 200 400 Feet

Former Estech General Chemical Site
Atlanta, Georgia

Soil Exposure Units for Short-tailed Shrew

Prepared by/Date: JRM - 6/29/2018	wood.	**Figure Number: D-2**
Checked by/Date: LO - 6/29/2018		
Project Number: 6122080154		

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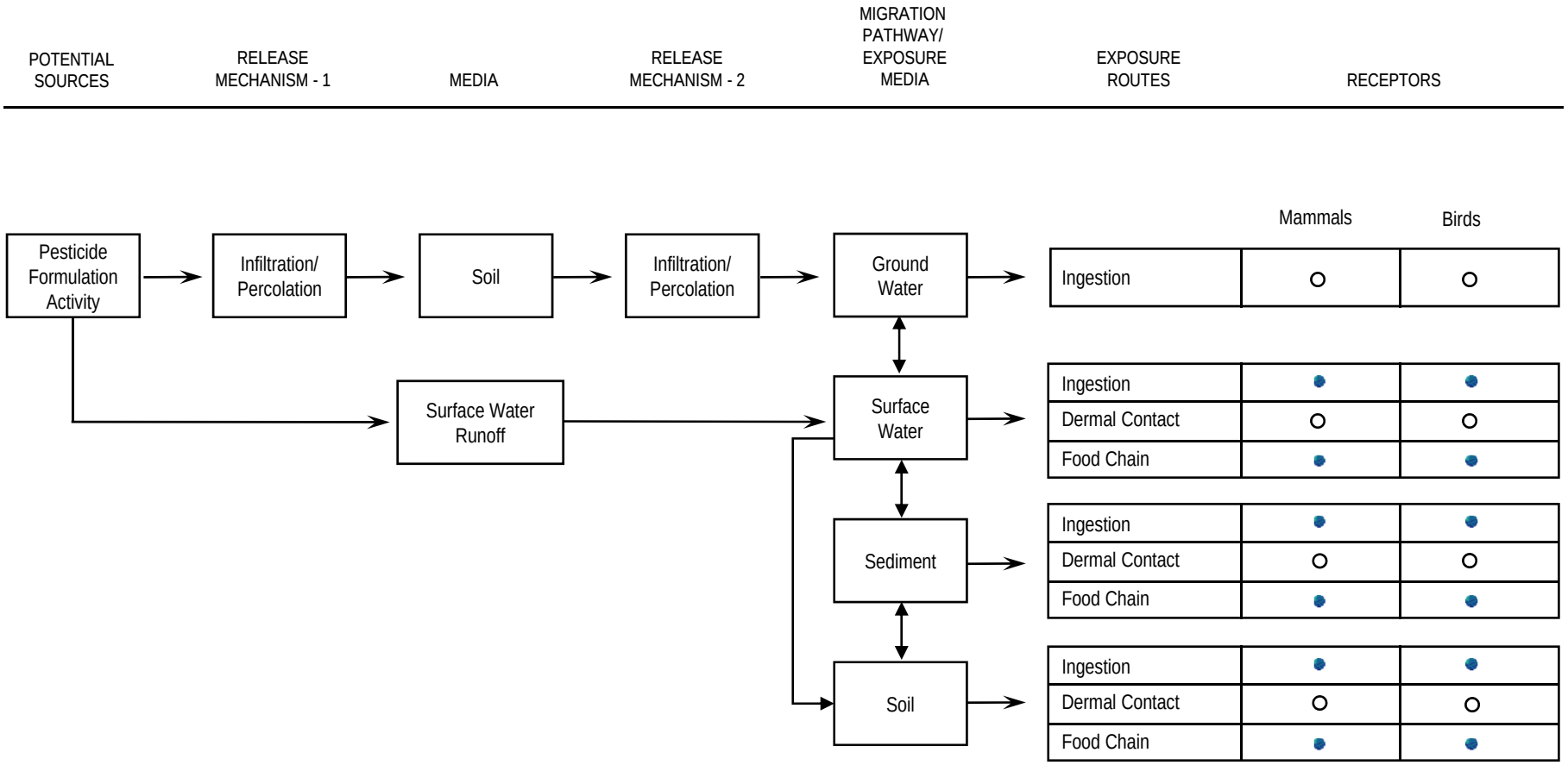


● Exposure pathway quantitatively evaluated in SLERA
○ Exposure pathway not evaluated in SLERA

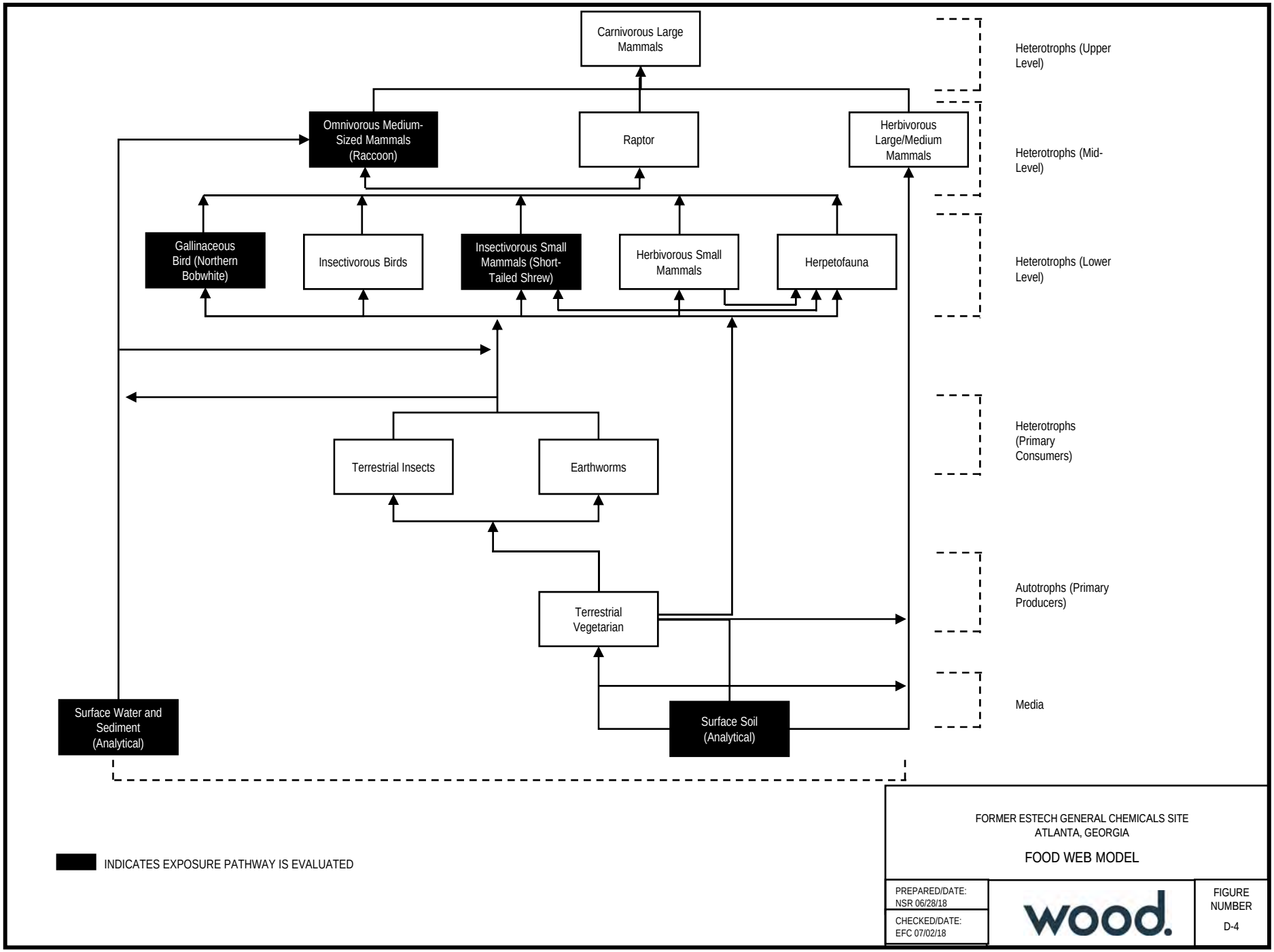
FORMER ESTECH GENERAL CHEMICALS SITE
ATLANTA, GEORGIA

Conceptual Site Model – Ecological Receptors

PREPARED/DATE: NSR 06/28/18
CHECKED/DATE: EFC 07/02/18

wood.

FIGURE NUMBER
D-3



FORMER ESTECH GENERAL CHEMICALS SITE
ATLANTA, GEORGIA

FOOD WEB MODEL

PREPARED/DATE: NSR 06/28/18	wood.	FIGURE NUMBER D-4
CHECKED/DATE: EFC 07/02/18		

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S01 S02 S03 S04 S05 S06 S07 S08 S09 S10 S11 S12 S13 S14 S15 S16 S17 S18

D1 E2 F3 D2 E3 F4 D3 E4 F5 C3 D4 E5 F6 C4 D5 E6 F7 C5 D6 E7 F8 C6 D7 E8 F9 C7 D8 E9 F10 C8 D9 E10 F11 C9 D10 E11 F12 C10 D11 E12 F13 B10 C11 D12 E13 F14 B11 C12 D13 E14 F15 B12 C13 D14 E15 F16 C14 D15 E16 F17 C15 D16 E17 F18 C16 D17 E18 F19 C17 D18 E19 F20 C18 D19 E20 F21 C19 D20 E21 F22 C20 D21 E22 F23 C21 D22 E23 F24 C22 D23 E24 F25 B22 C23 D24 E25 F26 A22 B23 C24 D25 E26 F27 A23 B24 C25 D26 E27 F28 A24 B25 C26 D27 E28 F29 A25 B26 C27 D28 E29 F30 A26 B27 C28 D29 E30 F31 B28 C29 D30 E31 F32 B29 C30 D31 E32 C31 D32 E33 C32 D33 E34 D34 E35

Legend

- 2018 Soil Boring Location
- 2018 DDT Corrective Action Location
- 2018 Lead Corrective Action Location
- Exposure Areas for Short-tailed Shrew
- Tax Parcel Boundary

0 200 400 Feet

Former Estech General Chemical Site
Atlanta, Georgia

Corrective Action Locations for the Northern Bobwhite

Prepared by/Date: JRM - 7/25/2018	
Checked by/Date: LO - 7/25/2018	wood.
Project Number: 6122080154	**Figure Number: D-5**

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S01 S02 S03 S04 S05 S06 S07 S08 S09 S10 S11 S12 S13 S14 S15 S16 S17 S18

D1 E2 F3 D2 E3 F4 D3 E4 F5 C3 D4 E5 F6 C4 D5 E6 F7 C5 D6 E7 F8 C6 D7 E8 F9 C7 D8 E9 F10 C8 D9 E10 F11 C9 D10 E11 F12 C10 D11 E12 F13 B10 C11 D12 E13 F14 B11 C12 D13 E14 F15 B12 C13 D14 E15 F16 C14 D15 E16 F17 C15 D16 E17 F18 C16 D17 E18 F19 C17 D18 E19 F20 C18 D19 E20 F21 C19 D20 E21 F22 C20 D21 E22 F23 C21 D22 E23 F24 C22 D23 E24 F25 B22 C23 D24 E25 F26 A22 B23 C24 D25 E26 F27 A23 B24 C25 D26 E27 F28 A24 B25 C26 D27 E28 F29 A25 B26 C27 D28 E29 F30 A26 B27 C28 D29 E30 F31 B28 C29 D30 E31 F32 B29 C30 D31 E32 C31 D32 E33 C32 D33 E34 D34 E35

Legend

- 2018 Soil Boring Location
- 2018 Dieldrin Corrective Action Location
- 2018 Arsenic Corrective Action Location
- 2018 DDT Corrective Action Location
- 2018 Zinc Corrective Action Location
- 2018 Lead Corrective Action Location
- Exposure Areas for Short-tailed Shrew
- Tax Parcel Boundary

0 200 400 Feet

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Former Estech General Chemical Site
Atlanta, Georgia

Corrective Action Locations for the
Short Tailed Shrew

Prepared by/Date: JRM - 7/25/2018	wood.	Figure Number: D-6
Checked by/Date: LO - 7/25/2018		
Project Number: 6122080154		

ATTACHMENT A-1

ProUCL Calculations - Site-wide Surficial Soil

A-1a ProUCL Data Set for Site-wide Surficial Soil

A-1b ProUCL Output for Site-wide Soil Metals and Pesticides

Attachment A-1a
ProUCL Data Set for Sitewide Soil

SID	LOC_ID	UOM	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	alpha-BHC	D_alpha-BHC	alpha-Chlordane	D_alpha-Chlordane	Arsenic	D_Arsenic	beta-BHC	D_beta-BHC	Copper	D_Copper	delta-BHC	D_delta-BHC	Dieldrin	D_Dieldrin	gamma-BHC (Lindane)	D_gamma-BHC (Lindane)	gamma-Chlordane	D_gamma-Chlordane	Heptachlor	D_Heptachlor	Lead	D_Lead	Methoxychlor	D_Methoxychlor	Toxaphene	D_Toxaphene	Zinc	D_Zinc
A22 (0-1) 020918	A22	mg/kg	0.52	1	3	1	19	1	0.13	0	0.13	0	45.5	1	0.13	0	120	1	0.13	0	0.26	1	0.13	0	0.13	0	0.13	0	412	1	1.3	0	130	0	446	1
A23 (0-1) 020918	A23	mg/kg	0.049	0	0.07	1	0.12	1	0.025	0	0.025	0	14	1	0.025	0	93	1	0.025	0	0.049	0	0.025	0	0.025	0	0.025	0	98.5	1	0.25	0	2.5	0	134	1
A24 (0-1) 020918	A24	mg/kg	0.051	1	0.16	1	2.1	1	0.012	0	0.012	0	18.4	1	0.012	0	117	1	0.012	0	0.023	0	0.012	0	0.012	0	0.012	0	180	1	0.12	0	1.4	1	524	1
A25 (0-1) 020918	A25	mg/kg	0.046	0	0.1	1	0.15	1	0.023	0	0.023	0	11.8	1	0.023	0	87.4	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	102	1	0.23	0	2.3	0	259	1
A26 (0-1) 020918	A26	mg/kg	0.084	0	0.68	1	0.19	1	0.042	0	0.042	0	28	1	0.042	0	62.3	1	0.042	0	0.084	0	0.042	0	0.042	0	0.042	0	407	1	0.42	0	4.2	0	168	1
B10 (0-1) 020918	B10	mg/kg	0.21	0	0.67	1	1.9	1	0.11	0	0.11	0	7.46	0	0.12	1	15.1	1	0.11	0	0.21	0	0.11	0	0.11	0	0.11	0	38.6	1	1.1	0	11	0	91.8	1
B11 (0-1) 020918	B11	mg/kg	0.079	0	0.24	1	1.1	1	0.04	0	0.04	0	7.44	0	0.11	1	18.5	1	0.04	0	0.079	0	0.04	0	0.04	0	0.04	0	38.1	1	0.4	0	4	0	84	1
B12 (0-1) 020918	B12	mg/kg	0.084	0	0.092	1	0.14	1	0.042	0	0.042	0	24.3	1	0.042	0	43.9	1	0.042	0	0.084	0	0.042	0	0.042	0	0.042	0	204	1	0.42	0	4.2	0	134	1
B22 (0-1) 020818	B22	mg/kg	0.009	0	0.078	1	0.091	1	0.0045	0	0.0045	0	74.8	1	0.0045	0	161	1	0.0045	0	0.009	0	0.0045	0	0.0045	0	0.0045	0	486	1	0.045	0	0.45	0	309	1
B23 (0-1) 020818	B23	mg/kg	1.1	1	1.2	1	16	1	0.061	1	0.22	1	23.5	1	0.055	1	99.1	1	0.051	0	0.35	1	0.051	0	0.46	1	0.051	0	300	1	5.1	0	51	0	460	1
B24 (0-1) 020818	B24	mg/kg	0.078	1	0.99	1	1	1	0.0047	0	0.0087	1	11.3	1	0.0047	0	66	1	0.0047	0	0.016	1	0.0047	0	0.0047	0	0.0047	0	126	1	1.2	0	0.49	1	146	1
B25 (0-1) 020818	B25	mg/kg	0.029	0	0.42	1	0.38	1	0.015	0	0.015	0	62	1	0.015	0	117	1	0.015	0	0.029	0	0.015	0	0.015	0	0.015	0	257	1	0.15	0	1.5	0	506	1
B26 (0-1) 020818	B26	mg/kg	0.0087	0	0.011	1	0.0087	0	0.0043	0	0.0043	0	7.4	0	0.0043	0	48.1	1	0.0043	0	0.0087	0	0.0043	0	0.0043	0	0.0043	0	71.1	1	0.043	0	0.43	0	101	1
B27 (0-1) 020818	B27	mg/kg	0.042	0	0.042	0	0.042	0	0.021	0	0.021	0	8.03	1	0.021	0	44.5	1	0.021	0	0.042	0	0.021	0	0.021	0	0.021	0	1030	1	0.21	0	2.1	0	173	1
B28 (0-1) 020818	B28	mg/kg	0.027	0	0.036	1	0.029	1	0.014	0	0.014	0	65.9	1	0.016	1	129	1	0.014	0	0.027	0	0.014	0	0.014	0	0.014	0	273	1	0.14	0	1.4	0	677	1
B29 (0-1) 020818	B29	mg/kg	0.021	0	0.021	0	0.021	0	0.011	0	0.011	0	12.5	1	0.011	0	55.8	1	0.011	0	0.021	0	0.011	0	0.011	0	0.011	0	92.8	1	0.11	0	1.1	0	315	1
C10 (0-1) 021418	C10	mg/kg	0.23	1	1.1	1	2.6	1	0.095	0	0.095	0	11.3	1	0.095	0	27.1	1	0.095	0	0.19	0	0.095	0	0.095	0	0.095	0	69.2	1	0.95	0	9.5	0	94.5	1
C11 (0-1) 020918	C11	mg/kg	0.038	0	0.11	1	0.19	1	0.019	0	0.019	0	7.44	0	0.019	0	13.3	1	0.019	0	0.038	0	0.019	0	0.019	0	0.019	0	37.9	1	0.19	0	19	0	61.8	1
C12 (0-1) 020918	C12	mg/kg	0.02	0	0.098	1	0.2	1	0.01	0	0.01	0	7.43	0	0.01	0	16.9	1	0.01	0	0.032	1	0.01	0	0.01	0	0.01	0	57.2	1	0.1	0	1	0	79.9	1
C13 (0-1) 020918	C13	mg/kg	0.044	0	0.044	0	0.069	1	0.022	0	0.022	0	17.2	1	0.022	0	16.4	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	65.7	1	0.22	0	2.2	0	49.7	1
C14 (0-1) 020918	C14	mg/kg	0.043	0	0.093	1	0.27	1	0.021	0	0.021	0	41.2	1	0.021	0	43.9	1	0.021	0	0.055	1	0.021	0	0.021	0	0.021	0	126	1	0.21	0	2.1	0	128	1
C15 (0-1) 020818	C15	mg/kg	0.024	0	0.024	0	0.3	1	0.012	0	0.012	0	7.46	0	0.021	1	25.1	1	0.012	0	0.024	0	0.012	0	0.021	1	0.012	1	35.4	1	0.12	0	1.2	0	65.6	1
C16 (0-1) 020818	C16	mg/kg	0.088	0	0.088	0	0.18	1	0.044	0	0.044	0	7.39	0	0.044	0	32.6	1	0.044	0	0.088	0	0.044	0	0.044	0	0.044	0	56.4	1	0.44	0	4.4	0	67.1	1
C17 (0-1) 020818	C17	mg/kg	0.44	0	0.79	1	4.9	1	0.22	0	0.22	0	34.6	1	0.84	1	85.4	1	0.22	0	0.44	0	0.22	0	0.22	0	0.22	0	217	1	2.2	0	22	0	215	1
C18 (0-1) 020818	C18	mg/kg	0.0073	0	0.11	1	0.13	1	0.0036	0	0.012	1	7.47	0	0.0036	0	6.98	1	0.0036	0	0.018	1	0.012	0	0.016	1	0.0036	0	14.9	1	0.036	0	0.74	1	32.7	1
C19 (0-1) 020818	C19	mg/kg	0.0041	0	0.036	1	0.12	1	0.002	0	0.042	1	7.4	0	0.0037	1	23.7	1	0.002	0	0.041	0	0.002	0	0.063	1	0.002	0	33.8	1	0.02	0	20	0	44.4	1
C20 (0-1) 020818	C20	mg/kg	27	1	25	1	1600	1	4.9	0	23	1	105	1	56	1	460	1	4.9	0	29	1	4.9	0	69	1	41	1	1330	1	49	0	490	0	784	1
C21 (0-1) 020818	C21	mg/kg	0.0043	0	0.055	1	0.15	1	0.0022	0	0.0055	1	36.5	1	0.021	1	151	1	0.0022	0	0.055	1	0.0022	0	0.019	1	0.0022	0	1340	1	0.022	0	0.25	1	166	1
C22 (0-1) 020818	C22	mg/kg	0.095	1	0.33	1	2.6	1	0.046	0	0.046	0	102	1	0.063	1	351	1	0.046	0	0.26	1	0.046	0	0.094	1	0.046	0	1320	1	0.46	0	4.6	0	559	1
C23 (0-1) 020818	C23	mg/kg	0.046	0	0.058	1	0.46	0	0.023	0	0.023	0	327	1	0.023	0	254	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	1210	1	0.23	0	2.3	0	201	1
C24 (0-1) 020818	C24	mg/kg	0.0048	0	0.0048	0	0.075	1	0.0024	0	0.0024	0	11.1	0	0.0024	0	44.1	1	0.0024	0	0.0048	0	0.0024	0	0.0024	0	0.0024	0	22.6	1	0.024	0	0.24	0	111	0
C25 (0-1) 020818	C25	mg/kg	0.009	0	0.009	0	0.009	0	0.0045	0	0.0045	0	288	1	0.0045	0	134	1	0.0045	0	0.009	0	0.0045	0	0.0045	0	0.0045	0	153	1	0.045	0	0.45	0	96.5	0
C26 (0-1) 020818	C26	mg/kg	0.023	0	0.18	1	0.043	1	0.012	0	0.012	0	247	1	0.012	0	522	1	0.012	0	0.023	0	0.012	0	0.012	0	0.012	0	1530	1	0.12	0	1.2	0	1320	1
C27 (0-1) 020618	C27	mg/kg	0.3	0	0.52	1	0.38	1	0.15	0	0.15	0	449	1	0.15	0	750	1	0.15	0	0.3	0	0.15	0	0.15	0	0.15	0	2130	1	1.5	0	15	0	1490	1
C28 (0-1) 020618	C28	mg/kg	0.022	0	0.022	0	0.022	0	0.011	0	0.011	0	170	1	0.011	0	109	1	0.011	0	0.022	0	0.011	0	0.011	0	0.011	0	499	1	0.11	0	1.1	0	391	1
C29 (0-1) 020618	C29	mg/kg	0.0043	0	0.0043	0	0.012	1	0.0022	0	0.0022	0	7.35	0	0.0022	0	25.5	1	0.0022	0	0.0043	0	0.0022	0	0.0022	0	0.0022	0	122	1	0.022	0	0.22	0	126	1
C3 (0-1) 021318	C3	mg/kg	0.22	0	1	1	2.6	1	0.11	0	0.11	0	51.2	1	0.11	0	159	1	0.11	0	0.22	0	0.11	0	0.13	1	0.11	0	481	1	1.1	0	11	0	445	1
C30 (0-1) 020618	C30	mg/kg	0.0092	0	0.0092	0	0.0092	0	0.0046	0	0.0046	0	7.14	0	0.0046	0	5.77	1	0.0046	0	0.0092	0	0.0046	0	0.0046	0	0.0046	0	49.7	1	0.046	0	0.46	0	68.6	1
C31 (0-1) 020618	C31	mg/kg	0.023	0	0.023	0	0.023	0	0.011	0	0.011	0	26.2	1	0.011	0	37.8	1	0.011	0	0.023	0	0.011	0	0.011	0	0.011	0	295	1	0.11	0	1.1	0	134	1
C32 (0-1) 020618	C32	mg/kg	0.023	0	0.053	1	0.037	1	0.011	0	0.011	0	68.5	1	0.011	0	52	1	0.011	0	0.023	0	0.011	0	0.011	0	0.011	0	997	1	0.11	0	1.1	0	189	1
C4 (0-1) 021318	C4	mg/kg	0.46	1	0.5	1	4.1	1	0.11	0	0.14	1	10.2	0	0.19	1	52.3	1	0.11	0	2.1	1	0.13	1	0.16	1	0.11	0	59.1	1	1.1	0	21	1	96.5	1
C5 (0-1) 021318	C5	mg/kg	0.36	1	0.64	1	5.8	1	0.11	0	0.22	1	175	1	0.44	1	130	1	0.11	0	0.63	1	0.11	0	0.2	1	0.11	0	957	1	1.1	0	17	1	601	1
C6 (0-1) 021318	C6	mg/kg	0.09	0	0.22	1	0.94	1	0.045	0	0.045	0	232	1	0.16	1	248	1	0.045	0	0.09	0	0.045	0	0.045	0	0.045	0	45100	1	0.45	0	4.5	0	401	1
C7 (0-1) 021318	C7	mg/kg	0.024	0	0.074	1	0.054	1	0.012	0	0.012	0	17	1	0.015	1	48.2	1	0.012	0	0.024	0	0.012	0	0.012	0	0.012	0	166	1	0.12	0	1.2	0	158	1
C8 (0-1) 020918	C8	mg/kg	0.36	1	1.6	1	16	1	0.08	1	0.2	1	102	1	1.3	1	268	1	0.057	1	0.63	1	0.06	1	0.61	1	0.043	0	1510	1	0.43	0	43	0	893	1
C9 (0-1) 021418	C9	mg/kg	0.23	1	0.82	1	4.1	1	0.16	1	0.037	1	24.6	1	0.31	1	81.3	1	0.028	0	0.36	1	0.11	1	0.065	1	0.028	0	301	1	0.28	0	4.5	1	359	1
D1 (0-1) 021318	D1	mg/kg	0.23	0	0.38	1	2.4	1	0.12	0	0.12	0	23	1	0.22	1	149	1	0.12	0	0.23	0	0.12	0	0.12	0	0.12	0	551	1	1.2	0	12	0	492	1
D10 (0-1) 020918	D10	mg/kg	0.5	0	2.8	1	8.6	1	0.25	0	0.25	0	12.7	1	0.25	0	54.1	1	0.25	0	0.5	0	0.25	0	0.25	0	0.25	0	219	1	2.5	0	25	0	143	1
D11 (0-1) 020918	D11	mg/kg	0.042	0	0.83	1	0.78	1	0.021	0	0.021	0	8	0	0.041	1	31.5	1	0.021	0	0.081	1	0.021	0	0.021	0	0.021	0	70.3	1	0.21	0	2.1	0	90	1
D12 (0-1) 020918	D12	mg/kg	0.44	0	1.2	1	2.7	1	0.22	0	0.22	0	125	1	0.22	0	457	1	0.22	0	0.44	0	0.22	0	0.22	0	0.22	0	1720	1	2.2	0	22	0	1530	1
D13 (0-1) 020918	D13	mg/kg	0.22	1	1.2	1	2.6	1	0.1	0	0.1	0	64.8	1	0.1	0	327	1	0.1	0	0.47	1	0.1	0	0.22	1	0.1	0	1110	1	1	0	10	0	971	1
D14 (0-1) 020918	D14	mg/kg	0.39	1	1.8	1	4.6	1	0.11	0	0.25	1	65.3	1	0.13	1	283	1	0.11	0	1.3	1	0.11	0	0.28	1	0.11	0	990	1	1.1	0	16	1	1110	1
D15 (0-1) 020818	D15	mg/kg	0.088	0	0.28	1	1.1	1	0.044	0	0.044	0	35.5	1	0.044	0	94.3	1	0.044	0	0.088	0	0.044	0	0.044	0	0.044	0	328	1	0.44	0	4.4	0	269	1
D16 (0-1) 020818	D16	mg/kg	0.45	0	0.45	0	1.4	1	0.23	0	0.23	0	61	1	0.23	0	239	1	0.23	0	0.45	0	0.23	0	0.23	0	0.23	0	793	1	2.3	0	23	0	767	1
D17 (0-1) 020918	D17	mg/kg	7.6	0	7.6	0	130	1	3.8	0	11	1	84.6	1	31	1	86.7	1	3.8	0	24	1	3.8	0	17	1	21	1	665	1	38	0	380	0	153	1
D18 (0-1) 020818	D18	mg/kg	0.43	0	2.3	1	43	0	0.61	1	3.2	1	312	1	4.5	1	526	1	0.21	0	8.9	1	0.44	1	4.4	1	2.8	1	3600	1	2.1	0	2100	0	599	1
D19 (0-1) 020818	D19	mg/kg	4.4	0	4.4	0	14	1	2.2	0	3.9	1	41.9	1	2.2	0	118	1	2.2	0	4.4	0	2.2	0	4.2	1	2.2	0	59.7	1	22	0	220	0	220	1
D2 (0-1) 021318	D2	mg/kg	0.094	0	0.58	1	1.5	1	0.047	0	0.047	0	29.9	1	0.051	1	183	1	0.047	0	0.098	1	0.047	0	0.047	0	0.047	0	299	1	0.47	0	4.7	0	491	1
D20 (0-1) 020818	D20	mg/kg	0.79	1	1.3	1	19	1	0.24	0	1.3	1	176	1	0.29	1	488	1	0.24	0	1.1	1	0.24	0	1.6	1	0.24	0	1350	1	24	0	240	0	960	1
D21 (0-1) 020818	D21	mg/kg	0.69	1	1	1	9.5	1	0.12	1	0.51	1	90.5	1	0.93	1	143	1	0.11	0	1.3	1	0.11	0	0.91	1	0.13	1	503	1	11	0	110	0	521	1
D22 (0-1) 020818	D22	mg/kg	0.88	1	1	1	19	1	0.14	1	0.18	1	188	1	0.59	1	606	1	0.061	1	0.9	1	0.064	1	0.84	1	0.4	1	2550	1	4.4	0	44	0	919	1
D23 (0-1) 020818	D23	mg/kg	0.046	0	0.046	0	0.046	0	0.023	0	0.023	0	9.97	0	0.023	0	118	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	180	1	0.23	0	2.3	0	901	1
D24 (0-1) 020818	D24	mg/kg	0.01	0	0.01	0	0.012	1	0.0052	0	0.0052	0	106	1	0.0052	0	308	1	0.0052	0	0.01	0	0.0052	0	0.0052	0	0.0052	0	708	1	0.052	0	0.52	0	358	1
D25 (0-1) 020818	D25	mg/kg	0.044	0	0.044	0	0.044	0	0.022	0	0.022	0	9.55	0	0.022	0	77.1	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	131	1	0.22	0	2.2	0	415	1
D26 (0-1) 020818	D26	mg/kg	0.025	0	0.06	1	0.05	1	0.013	0	0.013	0	1140	1	0.013	0	141	1	0.013	0	0.025	0	0.013	0	0.013	0	0.013	0	8170	1	0.13	0	1.3	0	210	1
D27 (0-1) 020618	D27	mg/kg	0.042	0	0.12	1	0.059	1	0.021	0	0.021	0	135	1	0.021	0	139	1	0.021	0	0.042	0	0.021	0	0.021	0	0.021	0	3740	1	0.21	0	2.1	0	186	1
D28 (0-1) 020618	D28	mg/kg	0.047	0	0.3	1	0.14	1	0.024	0	0.024	0	277	1	0.024	0	121	1	0.024	0	0.047	0	0.024	0	0.024	0	0.024	0	65600	1	0.24	0	2.4	0	189	1
D29 (0-1) 020618	D29	mg/kg	0.0046	0	0.0046	0	0.0046	0	0.0023	0	0.0023	0	11.6	0	0.0023	0	22.1	1	0.0023	0	0.0046	0	0.0023	0	0.0023	0	0.0023	0	51.4	1	0.023	0	0.23	0	144	1
D3 (0-1) 021318	D3	mg/kg	0.21	0	0.21	0	0.35	1	0.11	0	0.11	0	39.5	1	0.49	1	107	1	0.11	0	0.21	0	0.11	0	0.11	0	0.11	0	361	1	1.1	0	11	0	162	1
D30 (0-1) 020618	D30	mg/kg	0.022	0	0.086	1	0.065	1	0.011	0	0.011	0	13.4	1	0.011	0	22.4	1	0.011	0	0.022	0	0.011	0	0.011	0	0.011	0	270	1	0.11	0	1.1	0	122	1
D31 (0-1) 020618	D31	mg/kg	0.48	0	0.48	0	0.48	0	0.24	0	0.24	0	7.27	0	0.24	0	29.7	1	0.24	0	0.48	0	0.24	0	0.24	0	0.24	0	156	1	2.4	0	24	0	554	1
D32 (0-1) 020618	D32	mg/kg	0.47	0	0.47	0	0.47	0	0.24	0	0.24	0	7.48	0	0.24	0	22.1	1	0.24	0	0.47	0	0.24	0	0.24	0	0.24	0	222	1	2.4	0	24	0	533	1
D33 (0-1) 020618	D33	mg/kg	0.47	1	0.7	1	8	1	0.22	0	0.22	0	12.9	1	0.22	0	24.3	1	0.22	0	0.43	0	0.22	0	0.22	0	0.22	0	210	1	2.2	0	22	0	192	1
D34 (0-1) 020618	D34	mg/kg	0.0085	0	0.038	1	0.014	1	0.0043	0	0.0043	0	27.2	1	0.0043	0	28.7	1	0.0043	0	0.0085	0	0.0043	0	0.0043	0	0.0043	0	84.7	1	0.043	0	0.43	0	63.6	1
D4 (0-1) 021418	D4	mg/kg	0.038	0	0.038	0	0.038	0	0.019	0	0.019	0	664	1	0.019	0	1790	1	0.019	0	0.038	0	0.019	0	0.019	0	0.019	0	7080	1	0.19	0	1.9	0	2680	1
D5 (0-1) 021318	D5	mg/kg	0.043	0	0.043	0	0.043	0	0.022	0	0.022	0	871	1	0.022	0	1240	1	0.022	0	0.043	0	0.022	0	0.022	0	0.022	0	7990	1	0.22	0	2.2	0	2310	1

Attachment A-1a
ProUCL Data Set for Sitewide Soil

SID	LOC_ID	UOM	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	alpha-BHC	D_alpha-BHC	alpha-Chlordane	D_alpha-Chlordane	Arsenic	D_Arsenic	beta-BHC	D_beta-BHC	Copper	D_Copper	delta-BHC	D_delta-BHC	Dieldrin	D_Dieldrin	gamma-BHC (Lindane)	D_gamma-BHC (Lindane)	gamma-Chlordane	D_gamma-Chlordane	Heptachlor	D_Heptachlor	Lead	D_Lead	Methoxychlor	D_Methoxychlor	Toxaphene	D_Toxaphene	Zinc	D_Zinc
D6 (0-1) 021318	D6	mg/kg	0.11	1	0.13	1	0.84	1	0.021	0	0.021	0	13.4	1	0.021	0	39.9	1	0.021	0	0.05	1	0.021	0	0.029	1	0.021	0	107	1	0.21	0	2.1	0	124	1
D7 (0-1) 021318	D7	mg/kg	0.088	1	0.42	1	1.5	1	0.076	1	0.042	0	74.4	1	0.61	1	224	1	0.042	0	0.083	0	0.042	0	0.042	0	0.042	0	737	1	0.42	0	8.9	1	403	1
D8 (0-1) 021318	D8	mg/kg	0.22	0	0.67	1	1.1	1	0.11	0	0.11	0	152	1	0.15	1	784	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	2610	1	1.1	0	11	0	3130	1
D9 (0-1) 021318	D9	mg/kg	0.23	0	0.8	1	4.4	1	0.11	0	0.11	0	105	1	1.4	1	336	1	0.11	0	0.27	1	0.11	0	0.11	0	0.11	0	1820	1	1.1	0	11	0	1160	1
E10 (0-1) 020918	E10	mg/kg	0.21	0	2.1	1	2.8	1	0.11	0	0.11	0	257	1	0.17	1	240	1	0.11	0	0.24	1	0.11	0	0.12	1	0.11	0	1410	1	1.1	0	11	0	587	1
E11 (0-1) 020918	E11	mg/kg	0.2	0	0.33	1	0.96	1	0.1	0	0.1	0	495	1	0.21	1	2360	1	0.1	0	0.28	1	0.1	0	0.16	1	0.1	0	4340	1	1	0	10	0	4730	1
E12 (0-1) 020918	E12	mg/kg	0.37	1	1.1	1	6.2	1	0.045	0	1.2	1	8.09	1	1.7	1	146	1	0.045	0	0.77	1	0.045	0	2.1	1	0.42	1	84.7	1	0.45	0	4.5	0	293	1
E13 (0-1) 020918	E13	mg/kg	0.23	0	0.52	1	0.68	1	0.11	0	0.11	0	331	1	0.11	0	454	1	0.11	0	0.23	0	0.11	0	0.11	0	0.11	0	2820	1	1.1	0	11	0	2050	1
E14 (0-1) 020918	E14	mg/kg	0.043	0	0.12	1	0.14	1	0.025	1	0.021	0	122	1	0.025	1	907	1	0.021	0	0.043	0	0.021	0	0.021	0	0.021	0	1060	1	0.21	0	2.1	0	933	1
E15 (0-1) 020918	E15	mg/kg	0.043	0	0.14	1	0.21	1	0.022	0	0.022	0	66.4	1	0.022	0	411	1	0.022	0	0.043	0	0.022	0	0.022	0	0.022	0	590	1	0.22	0	2.2	0	4620	1
E16 (0-1) 020918	E16	mg/kg	0.48	1	0.96	1	5.5	1	0.12	0	0.46	1	23.3	1	0.12	0	97.7	1	0.12	0	0.24	0	0.12	0	0.38	1	0.12	0	295	1	1.2	0	16	1	255	1
E17 (0-1) 020918	E17	mg/kg	0.41	0	0.62	1	2.8	1	0.21	0	0.21	0	11.6	1	0.21	0	215	1	0.21	0	0.53	1	0.21	0	0.51	1	0.21	0	922	1	2.1	0	21	0	751	1
E18 (0-1) 020918	E18	mg/kg	0.47	0	0.66	1	2	1	0.24	0	0.24	0	7.67	1	0.24	0	140	1	0.24	0	0.47	0	0.24	0	0.24	0	0.24	0	718	1	2.4	0	24	0	767	1
E19 (0-1) 020918	E19	mg/kg	0.42	0	0.67	1	0.87	1	0.21	0	0.21	0	11.2	1	0.21	0	36.9	1	0.21	0	0.42	0	0.21	0	0.21	0	0.21	0	388	1	2.1	0	21	0	363	1
E2 (0-1) 021318	E2	mg/kg	0.05	0	0.12	1	0.055	1	0.025	0	0.025	0	109	1	0.025	0	305	1	0.025	0	0.05	0	0.025	0	0.025	0	0.025	0	1190	1	0.25	0	2.5	0	439	1
E20 (0-1) 020918	E20	mg/kg	0.22	0	0.22	0	0.22	0	0.11	0	0.11	0	7.42	0	0.11	0	34.2	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	92.7	1	1.1	0	11	0	141	1
E21 (0-1) 020918	E21	mg/kg	0.22	0	0.49	1	0.68	1	0.11	0	0.11	0	15.1	1	0.11	0	629	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	1540	1	1.1	0	11	0	733	1
E22 (0-1) 020918	E22	mg/kg	0.94	1	0.54	1	11	1	0.13	0	0.4	1	79	1	0.78	1	383	1	0.17	1	1	1	0.15	1	1	1	0.13	0	857	1	1.3	0	130	0	951	1
E23 (0-1) 020818	E23	mg/kg	0.48	0	0.48	0	0.51	1	0.24	0	0.24	0	16.9	1	0.24	0	60.2	1	0.24	0	0.48	0	0.24	0	0.24	0	0.24	0	1020	1	2.4	0	24	0	1000	1
E24 (0-1) 020818	E24	mg/kg	0.73	1	1.6	1	3.1	1	0.24	0	0.24	0	56.7	1	0.24	0	88.5	1	0.24	0	0.49	0	0.24	0	0.24	0	0.24	0	911	1	2.4	0	24	0	605	1
E25 (0-1) 020618	E25	mg/kg	22	1	4.5	0	1100	1	2.3	0	2.3	0	386	1	2.3	0	332	1	2.3	0	4.5	0	2.3	0	2.3	0	2.3	0	13400	1	230	0	230	0	702	1
E26 (0-1) 020618	E26	mg/kg	0.057	1	0.19	1	0.62	1	0.022	0	0.022	0	119	1	0.022	0	39.4	1	0.022	0	0.045	0	0.022	0	0.022	0	0.022	0	495	1	0.22	0	2.2	0	93.9	1
E27 (0-1) 020618	E27	mg/kg	0.049	0	0.4	1	0.25	1	0.025	0	0.025	0	253	1	0.025	0	120	1	0.025	0	0.049	0	0.025	0	0.025	0	0.025	0	78400	1	0.25	0	2.5	0	230	1
E28 (0-1) 020618	E28	mg/kg	0.044	0	0.14	1	0.14	1	0.022	0	0.022	0	41.7	1	0.022	0	45.7	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	1780	1	0.22	0	2.2	0	245	1
E29 (0-1) 020618	E29	mg/kg	0.51	0	1.3	1	1.1	1	0.26	0	0.26	0	23.8	1	0.26	0	44	1	0.26	0	0.51	0	0.26	0	0.26	0	0.26	0	566	1	2.6	0	26	0	242	1
E3 (0-1) 021318	E3	mg/kg	0.095	0	1.2	1	2.1	1	0.091	1	0.1	1	221	1	0.26	1	380	1	0.047	0	0.56	1	0.061	1	0.15	1	0.047	0	2460	1	0.47	0	8.7	1	753	1
E30 (0-1) 020618	E30	mg/kg	0.45	0	0.45	0	0.45	0	0.23	0	0.23	0	8.02	1	0.23	0	23.6	1	0.23	0	0.45	0	0.23	0	0.23	0	0.23	0	353	1	2.3	0	23	0	747	1
E31 (0-1) 020618	E31	mg/kg	0.047	0	0.07	1	0.16	1	0.024	0	0.024	0	8.09	1	0.024	0	19.2	1	0.024	0	0.047	0	0.024	0	0.024	0	0.024	0	102	1	0.24	0	2.4	0	198	1
E32 (0-1) 020618	E32	mg/kg	0.099	0	0.18	1	0.65	1	0.05	0	0.05	0	11.4	1	0.05	0	24.6	1	0.05	0	0.099	0	0.05	0	0.05	0	0.05	0	399	1	0.5	0	5	0	890	1
E33 (0-1) 020618	E33	mg/kg	10	1	4.2	0	340	1	2.1	0	2.1	0	10.8	1	2.1	0	17.2	1	2.1	0	4.2	0	2.1	0	2.1	0	2.1	0	120	1	210	0	210	0	127	1
E34 (0-1) 021418	E34	mg/kg	0.0042	0	0.0074	1	0.0042	0	0.0021	0	0.0021	0	7.47	0	0.0021	0	13.3	1	0.0021	0	0.0042	0	0.0021	0	0.0021	0	0.0021	0	67.3	1	0.021	0	0.21	0	46.1	1
E35 (0-1) 021418	E35	mg/kg	0.0041	0	0.0041	0	0.0041	0	0.0021	0	0.0021	0	7.5	0	0.0021	0	11	1	0.0021	0	0.0041	0	0.0021	0	0.0021	0	0.0021	0	33.7	1	0.021	0	0.21	0	33.9	1
E4 (0-1) 021318	E4	mg/kg	0.097	0	0.35	1	0.38	1	0.049	0	0.049	0	154	1	0.049	0	270	1	0.049	0	0.097	0	0.049	0	0.049	0	0.049	0	1380	1	0.49	0	4.9	0	491	1
E5 (0-1) 021318	E5	mg/kg	0.1	1	1.3	1	1.5	1	0.045	0	0.045	0	196	1	0.42	1	250	1	0.045	0	0.21	1	0.045	0	0.055	1	0.045	0	2100	1	0.45	0	8.4	1	390	1
E6 (0-1) 021318	E6	mg/kg	0.12	1	0.63	1	3.4	1	0.043	0	0.047	1	120	1	0.1	1	195	1	0.043	0	0.31	1	0.043	0	0.12	1	0.043	0	1230	1	0.43	0	4.8	1	451	1
E7 (0-1) 021318	E7	mg/kg	0.094	0	0.5	1	1.3	1	0.047	0	0.047	0	115	1	0.047	0	80.4	1	0.047	0	0.1	1	0.047	0	0.047	0	0.047	0	1730	1	0.47	0	4.7	0	156	1
E8 (0-1) 021318	E8	mg/kg	0.25	1	0.33	1	12	1	0.022	1	0.021	0	573	1	0.17	1	656	1	0.021	0	0.1	1	0.021	0	0.045	1	0.047	1	8850	1	0.21	0	2.2	1	835	1
E9 (0-1) 020918	E9	mg/kg	0.42	0	0.42	0	0.99	1	0.21	0	0.21	0	348	1	0.21	0	478	1	0.21	0	0.42	0	0.21	0	0.788	1	0.21	0	2470	1	2.1	0	21	0	788	1
F10 (0-1) 021318	F10	mg/kg	0.21	0	0.21	0	0.21	0	0.11	0	0.11	0	173	1	0.11	0	646	1	0.11	0	0.21	0	0.11	0	0.11	0	0.11	0	1420	1	1.1	0	11	0	764	1
F11 (0-1) 021318	F11	mg/kg	0.12	1	0.35	1	4.8	1	0.044	0	0.044	0	39.1	1	0.047	1	70	1	0.044	0	0.48	1	0.044	0	0.044	0	0.044	0	344	1	0.44	0	4.4	0	194	1
F12 (0-1) 021318	F12	mg/kg	2.5	1	2.4	1	7.9	1	0.19	1	0.84	1	37.1	1	1	1	257	1	0.11	0	1.5	1	0.11	0	2.5	1	0.11	0	1350	1	1.1	0	11	0	583	1
F13 (0-1) 021318	F13	mg/kg	0.41	0	0.41	0	0.97	1	0.2	0	0.2	0	308	1	0.2	0	35.4	1	0.2	0	0.41	0	0.2	0	0.2	0	0.2	0	161	1	2	0	20	0	133	1
F14 (0-1) 021318	F14	mg/kg	0.4	0	0.84	1	1.8	1	0.2	0	0.2	0	21.9	1	0.2	0	41.5	1	0.2	0	0.4	0	0.2	0	0.2	0	0.2	0	189	1	2	0	20	0	209	1
F15 (0-1) 021318	F15	mg/kg	0.088	0	0.55	1	1.3	1	0.044	0	0.058	1	9.38	1	0.044	0	34.4	1	0.044	0	0.1	1	0.044	0	0.082	1	0.044	0	93.4	1	0.44	0	4.4	0	154	1
F16 (0-1) 021318	F16	mg/kg	0.088	0	1.7	1	2.1	1	0.044	0	0.044	0	7.33	0	0.044	0	47.6	1	0.044	0	0.088	0	0.044	0	0.047	1	0.044	0	99.5	1	0.44	0	4.4	0	104	1
F17 (0-1) 021318	F17	mg/kg	0.22	0	0.33	1	0.62	1	0.11	0	0.11	0	7.8	1	0.11	0	34	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	132	1	1.1	0	11	0	301	1
F18 (0-1) 021418	F18	mg/kg	0.048	0	0.048	0	0.048	0	0.024	0	0.024	0	7.48	0	0.024	0	34.2	1	0.024	0	0.048	0	0.024	0	0.024	0	0.024	0	45.2	1	0.24	0	2.4	0	140	1
F19 (0-1) 021418	F19	mg/kg	0.084	0	0.084	0	0.3	1	0.042	0	0.042	0	7.43	0	0.042	0	31.2	1	0.042	0	0.084	0	0.042	0	0.042	0	0.042	0	37.1	1	0.42	0	4.2	0	106	1
F20 (0-1) 021418	F20	mg/kg	0.041	0	0.041	0	0.055	1	0.02	0	0.02	0	7.43	0	0.02	0	52.9	1	0.02	0	0.041	0	0.02	0	0.02	0	0.02	0	80.2	1	0.2	0	2	0	139	1
F21 (0-1) 021418	F21	mg/kg	0.087	0	0.087	0	0.087	0	0.044	0	0.044	0	18.8	1	0.044	0	38.2	1	0.044	0	0.087	0	0.044	0	0.044	0	0.044	0	146	1	0.44	0	4.4	0	351	1
F22 (0-1) 021418	F22	mg/kg	0.49	0	0.49	0	0.63	1	0.25	0	0.25	0	7.46	0	0.25	0	32	1	0.25	0	0.49	0	0.25	0	0.25	0	0.25	0	189	1	2.5	0	25	0	700	1
F23 (0-1) 021418	F23	mg/kg	0.22	0	0.22	0	0.76	1	0.11	0	0.11	0	8.38	1	0.11	0	31.9	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	183	1	1.1	0	11	0	609	1
F24 (0-1) 021418	F24	mg/kg	0.044	0	0.069	1	0.14	1	0.022	0	0.022	0	7.4	0	0.022	0	33.8	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	262	1	0.22	0	2.2	0	894	1
F25 (0-1) 021418	F25	mg/kg	0.046	0	0.046	0	0.046	0	0.023	0	0.023	0	61.4	1	0.023	0	77	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	2610	1	0.23	0	2.3	0	669	1
F26 (0-1) 021418	F26	mg/kg	0.044	0	0.064	1	0.064	1	0.022	0	0.022	0	120	1	0.022	0	48.9	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	5310	1	0.22	0	2.2	0	193	1
F27 (0-1) 021418	F27	mg/kg	0.042	0	0.042	0	0.042	0	0.021	0	0.021	0	16.8	1	0.021	0	24.3	1	0.021	0	0.042	0	0.021	0	0.021	0	0.021	0	327	1	0.21	0	2.1	0	364	1
F28 (0-1) 021418	F28	mg/kg	0.045	0	0.045	0	0.045	0	0.023	0	0.023	0	60.1	1	0.023	0	43.8	1	0.023	0	0.045	0	0.023	0	0.023	0	0.023	0	1890	1	0.23	0	2.3	0	780	1
F29 (0-1) 021418	F29	mg/kg	0.77	1	0.71	1	17	1	0.13	0	0.6	1	19.2	1	0.38	1	48	1	0.13	0	15	1	0.13	0	0.56	1	0.37	1	344	1	1.3	0	13	0	588	1
F3 (0-1) 021318	F3	mg/kg	0.25	0	0.3	1	2.6	1	0.12	0	0.12	0	2430	1	0.12	0	514	1	0.12	0	0.35	1	0.12	0	0.12	0	0.12	0	10100	1	1.2	0	12	0	573	1
F30 (0-1) 021418	F30	mg/kg	0.0046	0	0.0046	0	0.0046	0	0.0023	0	0.0023	0	7.46	0	0.0023	0	19.9	1	0.0023	0	0.0046	0	0.0023	0	0.0023	0	0.0023	0	46.5	1	0.023	0	0.23	0	97	1
F31 (0-1) 021418	F31	mg/kg	4.5	0	0.72	1	82	1	0.022	0	0.078	1	27.6	1	0.46	1	37.2	1	0.022	0	1.1	1	0.022	0	0.22	1	0.17	1	238	1	0.22	0	220	0	147	1
F32 (0-1) 021418	F32	mg/kg	0.27	1	0.18	1	6.5	1	0.022	0	0.022	0	13.8	1	0.094	1	39.5	1	0.024	1	0.15	1	0.022	0	0.035	1	0.022	0	136	1	0.22	0	2.2	0	135	1
F4 (0-1) 021318	F4	mg/kg	15	1	5.9	1	280	1	1.1	1	0.13	0	295	1	99	1	249	1	1.9	1	0.26	0	0.99	1	0.13	0	0.13	0	2460	1	1.3	0	13	0	405	1
F5 (0-1) 021318	F5	mg/kg	0.24	0	0.75	1	1.9	1	0.12	0	0.12	0	158	1	0.29	1	240	1	0.12	0	0.24	0	0.12	0	0.12	0	0.12	0	2330	1	1.2	0	12	0	719	1
F6 (0-1) 021318	F6	mg/kg	0.072	1	0.44	1	2.3	1	0.028	1	0.023	0	286	1	0.17	1	549	1	0.023	0	0.18	1	0.023	0	0.023	0	0.023	0	5550	1	0.23	0	2.3	0	717	1
F7 (0-1) 021318	F7	mg/kg	0.17	1	2.2	1	5.8	1	0.041	1	0.045	1	345	1	0.13	1	376	1	0.022	0	6.1	1	0.031	1	0.088	1	0.022	0	5840	1	0.22	0	4.3	1	442	1
F8 (0-1) 021318	F8	mg/kg	0.043	0	0.17	1	0.41	1	0.022	0	0.022	0	399	1	0.46	1	1010	1	0.022	0	0.043	0	0.022	0	0.022	0	0.022	0	15100	1	0.22	0	2.2	0	1530	1
F9 (0-1) 021318	F9	mg/kg	0.085	0	0.41	1	0.83	1	0.043	0	0.043	0	296	1	0.043	0	1270	1	0.043	0	0.085	0	0.043	0	0.043	0	0.043	0	5550	1	0.43	0	4.3	0	1370	1

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/21/2018 3:15:02 PM
From File	2018_05_21 Eco SO (2018) ProUCL input DRAFT - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD

General Statistics

Total Number of Observations	144	Number of Distinct Observations	87
Number of Detects	36	Number of Non-Detects	108
Number of Distinct Detects	33	Number of Distinct Non-Detects	61
Minimum Detect	0.051	Minimum Non-Detect	0.0041
Maximum Detect	27	Maximum Non-Detect	7.6
Variance Detects	38.16	Percent Non-Detects	75%
Mean Detects	2.446	SD Detects	6.178
Median Detects	0.365	CV Detects	2.525
Skewness Detects	3.13	Kurtosis Detects	9.262
Mean of Logged Detects	-0.815	SD of Logged Detects	1.612

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.43	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.447	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.145	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

KM Mean	0.624	KM Standard Error of Mean	0.272
KM SD	3.223	95% KM (BCA) UCL	1.091
95% KM (t) UCL	1.075	95% KM (Percentile Bootstrap) UCL	1.116
95% KM (z) UCL	1.072	95% KM Bootstrap t UCL	1.635
90% KM Chebyshev UCL	1.441	95% KM Chebyshev UCL	1.811
97.5% KM Chebyshev UCL	2.325	99% KM Chebyshev UCL	3.335

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.447	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.837	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.316	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.158	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

k hat (MLE)	0.387	k star (bias corrected MLE)	0.373
Theta hat (MLE)	6.322	Theta star (bias corrected MLE)	6.555
nu hat (MLE)	27.86	nu star (bias corrected)	26.87
Mean (detects)	2.446		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.619
Maximum	27	Median	0.01
SD	3.234	CV	5.224
k hat (MLE)	0.227	k star (bias corrected MLE)	0.227
Theta hat (MLE)	2.728	Theta star (bias corrected MLE)	2.729
nu hat (MLE)	65.37	nu star (bias corrected)	65.34
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (65.34, α)	47.74	Adjusted Chi Square Value (65.34, β)	47.59
95% Gamma Approximate UCL (use when n>=50)	0.847	95% Gamma Adjusted UCL (use when n<50)	0.85

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.624	SD (KM)	3.223
Variance (KM)	10.39	SE of Mean (KM)	0.272
k hat (KM)	0.0375	k star (KM)	0.0413
nu hat (KM)	10.8	nu star (KM)	11.9
theta hat (KM)	16.65	theta star (KM)	15.1
80% gamma percentile (KM)	0.0397	90% gamma percentile (KM)	0.716
95% gamma percentile (KM)	3.049	99% gamma percentile (KM)	14.58

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.90, α)	5.164	Adjusted Chi Square Value (11.90, β)	5.119
95% Gamma Approximate KM-UCL (use when n>=50)	1.438	95% Gamma Adjusted KM-UCL (use when n<50)	1.451

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.154	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.145	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	0.617	Mean in Log Scale	-4.394
SD in Original Scale	3.235	SD in Log Scale	2.433
95% t UCL (assumes normality of ROS data)	1.063	95% Percentile Bootstrap UCL	1.109
95% BCA Bootstrap UCL	1.316	95% Bootstrap t UCL	1.609

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

95% H-UCL (Log ROS)	0.519

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.126	KM Geo Mean	0.0161
KM SD (logged)	2.222	95% Critical H Value (KM-Log)	3.557
KM Standard Error of Mean (logged)	0.203	95% H-UCL (KM -Log)	0.369
KM SD (logged)	2.222	95% Critical H Value (KM-Log)	3.557
KM Standard Error of Mean (logged)	0.203		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.719	Mean in Log Scale	-2.68
SD in Original Scale	3.241	SD in Log Scale	1.888
95% t UCL (Assumes normality)	1.167	95% H-Stat UCL	0.67

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 (Chebyshev) UCL	1.811

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'-DDE

General Statistics

Total Number of Observations	144	Number of Distinct Observations	104
Number of Detects	102	Number of Non-Detects	42
Number of Distinct Detects	75	Number of Distinct Non-Detects	34
Minimum Detect	0.0074	Minimum Non-Detect	0.0041
Maximum Detect	25	Maximum Non-Detect	7.6
Variance Detects	6.472	Percent Non-Detects	29.17%
Mean Detects	0.919	SD Detects	2.544
Median Detects	0.465	CV Detects	2.767
Skewness Detects	8.644	Kurtosis Detects	81.43
Mean of Logged Detects	-0.99	SD of Logged Detects	1.333

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.295	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.088	Detected Data Not Normal at 5% Significance Level	

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Detected Data Not Normal at 5% Significance Level

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.674	KM Standard Error of Mean	0.182
KM SD	2.169	95% KM (BCA) UCL	0.975
95% KM (t) UCL	0.975	95% KM (Percentile Bootstrap) UCL	1.016
95% KM (z) UCL	0.973	95% KM Bootstrap t UCL	1.54
90% KM Chebyshev UCL	1.22	95% KM Chebyshev UCL	1.467
97.5% KM Chebyshev UCL	1.81	99% KM Chebyshev UCL	2.484

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.297	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.802	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.123	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.0929	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)	0.671	k star (bias corrected MLE)	0.658
Theta hat (MLE)	1.371	Theta star (bias corrected MLE)	1.398
nu hat (MLE)	136.8	nu star (bias corrected)	134.1
Mean (detects)	0.919		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0074	Mean	0.654
Maximum	25	Median	0.175
SD	2.178	CV	3.329
k hat (MLE)	0.405	k star (bias corrected MLE)	0.401
Theta hat (MLE)	1.614	Theta star (bias corrected MLE)	1.63
nu hat (MLE)	116.7	nu star (bias corrected)	115.6
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (115.62, α)	91.79	Adjusted Chi Square Value (115.62, β)	91.58
95% Gamma Approximate UCL (use when n>=50)	0.824	95% Gamma Adjusted UCL (use when n<50)	0.826

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.674	SD (KM)	2.169
Variance (KM)	4.703	SE of Mean (KM)	0.182
k hat (KM)	0.0967	k star (KM)	0.0993
nu hat (KM)	27.84	nu star (KM)	28.59
theta hat (KM)	6.976	theta star (KM)	6.792
80% gamma percentile (KM)	0.463	90% gamma percentile (KM)	1.789
95% gamma percentile (KM)	3.915	99% gamma percentile (KM)	10.75

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.59, α)	17.39	Adjusted Chi Square Value (28.59, β)	17.3
95% Gamma Approximate KM-UCL (use when n>=50)	1.109	95% Gamma Adjusted KM-UCL (use when n<50)	1.114

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.982	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.625	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0823	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.088	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	0.667	Mean in Log Scale	-1.654
SD in Original Scale	2.174	SD in Log Scale	1.584
95% t UCL (assumes normality of ROS data)	0.967	95% Percentile Bootstrap UCL	1.008
95% BCA Bootstrap UCL	1.302	95% Bootstrap t UCL	1.526
95% H-UCL (Log ROS)	0.973		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.953	KM Geo Mean	0.142
KM SD (logged)	2.07	95% Critical H Value (KM-Log)	3.371
KM Standard Error of Mean (logged)	0.185	95% H-UCL (KM -Log)	2.165
KM SD (logged)	2.07	95% Critical H Value (KM-Log)	3.371
KM Standard Error of Mean (logged)	0.185		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.742	Mean in Log Scale	-1.626
SD in Original Scale	2.196	SD in Log Scale	1.839
95% t UCL (Assumes normality)	1.045	95% H-Stat UCL	1.717

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

KM H-UCL	2.165

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.

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

4,4'-DDT

General Statistics

Total Number of Observations	144	Number of Distinct Observations	105
Number of Detects	117	Number of Non-Detects	27
Number of Distinct Detects	84	Number of Distinct Non-Detects	23
Minimum Detect	0.012	Minimum Non-Detect	0.0041
Maximum Detect	1600	Maximum Non-Detect	43
Variance Detects	33314	Percent Non-Detects	18.75%
Mean Detects	32.86	SD Detects	182.5
Median Detects	1.1	CV Detects	5.554
Skewness Detects	7.365	Kurtosis Detects	56.97
Mean of Logged Detects	0.0881	SD of Logged Detects	2.237

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.197	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.479	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0822	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

KM Mean	26.72	KM Standard Error of Mean	13.75
KM SD	164.3	95% KM (BCA) UCL	53.78
95% KM (t) UCL	49.49	95% KM (Percentile Bootstrap) UCL	51.17
95% KM (z) UCL	49.34	95% KM Bootstrap t UCL	128.7
90% KM Chebyshev UCL	67.97	95% KM Chebyshev UCL	86.66
97.5% KM Chebyshev UCL	112.6	99% KM Chebyshev UCL	163.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	15.68	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.911	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.286	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.0942	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)	0.214	k star (bias corrected MLE)	0.214
Theta hat (MLE)	153.6	Theta star (bias corrected MLE)	153.5
nu hat (MLE)	50.06	nu star (bias corrected)	50.11
Mean (detects)	32.86		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	26.7
Maximum	1600	Median	0.64
SD	164.9	CV	6.176
k hat (MLE)	0.183	k star (bias corrected MLE)	0.184
Theta hat (MLE)	145.9	Theta star (bias corrected MLE)	145.2
nu hat (MLE)	52.71	nu star (bias corrected)	52.94
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (52.94, α)	37.23	Adjusted Chi Square Value (52.94, β)	37.1
95% Gamma Approximate UCL (use when n>=50)	37.97	95% Gamma Adjusted UCL (use when n<50)	38.11

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	26.72	SD (KM)	164.3
Variance (KM)	26999	SE of Mean (KM)	13.75
k hat (KM)	0.0264	k star (KM)	0.0305
nu hat (KM)	7.615	nu star (KM)	8.79
theta hat (KM)	1010	theta star (KM)	875.5
80% gamma percentile (KM)	0.337	90% gamma percentile (KM)	16.25
95% gamma percentile (KM)	105.1	99% gamma percentile (KM)	686.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.79, α)	3.201	Adjusted Chi Square Value (8.79, β)	3.167
95% Gamma Approximate KM-UCL (use when n>=50)	73.38	95% Gamma Adjusted KM-UCL (use when n<50)	74.17

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.962	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.0184	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0634	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0822	Detected Data appear 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	26.71	Mean in Log Scale	-0.718
SD in Original Scale	164.9	SD in Log Scale	2.665
95% t UCL (assumes normality of ROS data)	49.45	95% Percentile Bootstrap UCL	53.19
95% BCA Bootstrap UCL	61.3	95% Bootstrap t UCL	136.4
95% H-UCL (Log ROS)	42.53		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.795	KM Geo Mean	0.451
KM SD (logged)	2.792	95% Critical H Value (KM-Log)	4.28
KM Standard Error of Mean (logged)	0.238	95% H-UCL (KM -Log)	60.35
KM SD (logged)	2.792	95% Critical H Value (KM-Log)	4.28
KM Standard Error of Mean (logged)	0.238		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	26.86	Mean in Log Scale	-0.632
SD in Original Scale	164.9	SD in Log Scale	2.65
95% t UCL (Assumes normality)	49.6	95% H-Stat UCL	44.15

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	60.35

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-BHC

General Statistics

Total Number of Observations	144	Number of Distinct Observations	62
Number of Detects	14	Number of Non-Detects	130
Number of Distinct Detects	14	Number of Distinct Non-Detects	51
Minimum Detect	0.022	Minimum Non-Detect	0.002
Maximum Detect	1.1	Maximum Non-Detect	4.9
Variance Detects	0.0898	Percent Non-Detects	90.28%
Mean Detects	0.196	SD Detects	0.3
Median Detects	0.0855	CV Detects	1.529
Skewness Detects	2.612	Kurtosis Detects	6.795
Mean of Logged Detects	-2.325	SD of Logged Detects	1.137

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.597	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.365	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0242	KM Standard Error of Mean	0.00972
KM SD	0.109	95% KM (BCA) UCL	0.0405
95% KM (t) UCL	0.0403	95% KM (Percentile Bootstrap) UCL	0.0416
95% KM (z) UCL	0.0402	95% KM Bootstrap t UCL	0.0659
90% KM Chebyshev UCL	0.0533	95% KM Chebyshev UCL	0.0666
97.5% KM Chebyshev UCL	0.0849	99% KM Chebyshev UCL	0.121

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.885	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.766	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.224	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.237	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.847	k star (bias corrected MLE)	0.713
Theta hat (MLE)	0.231	Theta star (bias corrected MLE)	0.275
nu hat (MLE)	23.72	nu star (bias corrected)	19.97
Mean (detects)	0.196		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0281
Maximum	1.1	Median	0.01
SD	0.106	CV	3.772
k hat (MLE)	0.74	k star (bias corrected MLE)	0.729
Theta hat (MLE)	0.038	Theta star (bias corrected MLE)	0.0385
nu hat (MLE)	213	nu star (bias corrected)	209.9
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (209.91, α)	177.4	Adjusted Chi Square Value (209.91, β)	177.1
95% Gamma Approximate UCL (use when n>=50)	0.0332	95% Gamma Adjusted UCL (use when n<50)	0.0333

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0242	SD (KM)	0.109
Variance (KM)	0.0119	SE of Mean (KM)	0.00972
k hat (KM)	0.0491	k star (KM)	0.0527
nu hat (KM)	14.13	nu star (KM)	15.17
theta hat (KM)	0.493	theta star (KM)	0.459
80% gamma percentile (KM)	0.00392	90% gamma percentile (KM)	0.0394
95% gamma percentile (KM)	0.131	99% gamma percentile (KM)	0.515

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ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.17, α)	7.377	Adjusted Chi Square Value (15.17, β)	7.322
95% Gamma Approximate KM-UCL (use when n>=50)	0.0497	95% Gamma Adjusted KM-UCL (use when n<50)	0.0501

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.137	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.226	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	0.0215	Mean in Log Scale	-6.305
SD in Original Scale	0.107	SD in Log Scale	1.847
95% t UCL (assumes normality of ROS data)	0.0362	95% Percentile Bootstrap UCL	0.0371
95% BCA Bootstrap UCL	0.047	95% Bootstrap t UCL	0.0722
95% H-UCL (Log ROS)	0.0162		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.668	KM Geo Mean	0.00346
KM SD (logged)	1.358	95% Critical H Value (KM-Log)	2.552
KM Standard Error of Mean (logged)	0.142	95% H-UCL (KM -Log)	0.0116
KM SD (logged)	1.358	95% Critical H Value (KM-Log)	2.552
KM Standard Error of Mean (logged)	0.142		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.104	Mean in Log Scale	-3.697
SD in Original Scale	0.31	SD in Log Scale	1.588
95% t UCL (Assumes normality)	0.147	95% H-Stat UCL	0.127

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	0.0497

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

alpha-Chlordane

General Statistics

Total Number of Observations	144	Number of Distinct Observations	63
Number of Detects	27	Number of Non-Detects	117
Number of Distinct Detects	26	Number of Distinct Non-Detects	45
Minimum Detect	0.0055	Minimum Non-Detect	0.0021
Maximum Detect	23	Maximum Non-Detect	2.3
Variance Detects	22.89	Percent Non-Detects	81.25%
Mean Detects	1.78	SD Detects	4.784
Median Detects	0.22	CV Detects	2.688
Skewness Detects	3.895	Kurtosis Detects	16.07
Mean of Logged Detects	-1.443	SD of Logged Detects	2.054

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.413	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.923	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.392	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.167	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

KM Mean	0.339	KM Standard Error of Mean	0.182
KM SD	2.148	95% KM (BCA) UCL	0.669
95% KM (t) UCL	0.641	95% KM (Percentile Bootstrap) UCL	0.667
95% KM (z) UCL	0.639	95% KM Bootstrap t UCL	1.777
90% KM Chebyshev UCL	0.886	95% KM Chebyshev UCL	1.134
97.5% KM Chebyshev UCL	1.478	99% KM Chebyshev UCL	2.154

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.742	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.845	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.216	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.182	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)	0.335	k star (bias corrected MLE)	0.323
Theta hat (MLE)	5.307	Theta star (bias corrected MLE)	5.514
nu hat (MLE)	18.11	nu star (bias corrected)	17.43
Mean (detects)	1.78		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0055	Mean	0.342
Maximum	23	Median	0.01
SD	2.154	CV	6.303
k hat (MLE)	0.243	k star (bias corrected MLE)	0.242
Theta hat (MLE)	1.408	Theta star (bias corrected MLE)	1.41
nu hat (MLE)	69.94	nu star (bias corrected)	69.81
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (69.81, α)	51.58	Adjusted Chi Square Value (69.81, β)	51.42
95% Gamma Approximate UCL (use when n>=50)	0.463	95% Gamma Adjusted UCL (use when n<50)	0.464

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.339	SD (KM)	2.148
Variance (KM)	4.612	SE of Mean (KM)	0.182
k hat (KM)	0.0249	k star (KM)	0.029
nu hat (KM)	7.18	nu star (KM)	8.364
theta hat (KM)	13.6	theta star (KM)	11.68
80% gamma percentile (KM)	0.00309	90% gamma percentile (KM)	0.181
95% gamma percentile (KM)	1.272	99% gamma percentile (KM)	8.829

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.36, α)	2.947	Adjusted Chi Square Value (8.36, β)	2.915
95% Gamma Approximate KM-UCL (use when n>=50)	0.962	95% Gamma Adjusted KM-UCL (use when n<50)	0.973

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.923	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0817	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.167	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	0.335	Mean in Log Scale	-6.839
SD in Original Scale	2.155	SD in Log Scale	3.295
95% t UCL (assumes normality of ROS data)	0.632	95% Percentile Bootstrap UCL	0.675
95% BCA Bootstrap UCL	0.824	95% Bootstrap t UCL	1.845
95% H-UCL (Log ROS)	0.954		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.005	KM Geo Mean	0.0067
KM SD (logged)	2.057	95% Critical H Value (KM-Log)	3.355
KM Standard Error of Mean (logged)	0.207	95% H-UCL (KM -Log)	0.0991
KM SD (logged)	2.057	95% Critical H Value (KM-Log)	3.355
KM Standard Error of Mean (logged)	0.207		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.378	Mean in Log Scale	-3.468
SD in Original Scale	2.153	SD in Log Scale	1.804
95% t UCL (Assumes normality)	0.675	95% H-Stat UCL	0.251

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

KM H-UCL 0.0991

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.

Arsenic

General Statistics

Total Number of Observations	144	Number of Distinct Observations	127
Number of Detects	115	Number of Non-Detects	29
Number of Distinct Detects	109	Number of Distinct Non-Detects	19
Minimum Detect	7.67	Minimum Non-Detect	7.14
Maximum Detect	2430	Maximum Non-Detect	11.6
Variance Detects	77272	Percent Non-Detects	20.14%
Mean Detects	149.7	SD Detects	278
Median Detects	62	CV Detects	1.857
Skewness Detects	5.586	Kurtosis Detects	40.94
Mean of Logged Detects	4.126	SD of Logged Detects	1.33

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.509	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.305	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0829	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

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ProUCL Output for Sitewide Soil Metals and Pesticides

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	121	KM Standard Error of Mean	21.25
KM SD	253.9	95% KM (BCA) UCL	161
95% KM (t) UCL	156.2	95% KM (Percentile Bootstrap) UCL	159.1
95% KM (z) UCL	156	95% KM Bootstrap t UCL	177.9
90% KM Chebyshev UCL	184.8	95% KM Chebyshev UCL	213.6
97.5% KM Chebyshev UCL	253.7	99% KM Chebyshev UCL	332.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.713	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.801	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.114	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.0893	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)	0.686	k star (bias corrected MLE)	0.674
Theta hat (MLE)	218.1	Theta star (bias corrected MLE)	222
nu hat (MLE)	157.9	nu star (bias corrected)	155.1
Mean (detects)	149.7		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	119.6
Maximum	2430	Median	35.05
SD	255.4	CV	2.136
k hat (MLE)	0.287	k star (bias corrected MLE)	0.286
Theta hat (MLE)	416	Theta star (bias corrected MLE)	418
nu hat (MLE)	82.76	nu star (bias corrected)	82.37
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (82.37, α)	62.46	Adjusted Chi Square Value (82.37, β)	62.28
95% Gamma Approximate UCL (use when n>=50)	157.7	95% Gamma Adjusted UCL (use when n<50)	158.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	121	SD (KM)	253.9
Variance (KM)	64440	SE of Mean (KM)	21.25
k hat (KM)	0.227	k star (KM)	0.227
nu hat (KM)	65.45	nu star (KM)	65.42
theta hat (KM)	532.5	theta star (KM)	532.8
80% gamma percentile (KM)	169.3	90% gamma percentile (KM)	365.2
95% gamma percentile (KM)	602.3	99% gamma percentile (KM)	1242

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (65.42, α)	47.8	Adjusted Chi Square Value (65.42, β)	47.65
95% Gamma Approximate KM-UCL (use when n>=50)	165.6	95% Gamma Adjusted KM-UCL (use when n<50)	166.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.95	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.00104	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0811	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0829	Detected Data appear 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	120.3	Mean in Log Scale	3.544
SD in Original Scale	255.1	SD in Log Scale	1.669
95% t UCL (assumes normality of ROS data)	155.5	95% Percentile Bootstrap UCL	158.3
95% BCA Bootstrap UCL	170.7	95% Bootstrap t UCL	177.3
95% H-UCL (Log ROS)	208.8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.692	KM Geo Mean	40.14
KM SD (logged)	1.465	95% Critical H Value (KM-Log)	2.667
KM Standard Error of Mean (logged)	0.123	95% H-UCL (KM -Log)	162.7
KM SD (logged)	1.465	95% Critical H Value (KM-Log)	2.667
KM Standard Error of Mean (logged)	0.123		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	120.4	Mean in Log Scale	3.571
SD in Original Scale	255	SD in Log Scale	1.626
95% t UCL (Assumes normality)	155.5	95% H-Stat UCL	196.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL 162.7

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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ProUCL Output for Sitewide Soil Metals and Pesticides

beta-BHC

General Statistics

Total Number of Observations	144	Number of Distinct Observations	74
Number of Detects	48	Number of Non-Detects	96
Number of Distinct Detects	42	Number of Distinct Non-Detects	44
Minimum Detect	0.0037	Minimum Non-Detect	0.0021
Maximum Detect	99	Maximum Non-Detect	2.3
Variance Detects	277.6	Percent Non-Detects	66.67%
Mean Detects	4.29	SD Detects	16.66
Median Detects	0.215	CV Detects	3.883
Skewness Detects	4.82	Kurtosis Detects	24.45
Mean of Logged Detects	-1.33	SD of Logged Detects	1.98

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.289	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.478	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.127	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

KM Mean	1.438	KM Standard Error of Mean	0.819
KM SD	9.73	95% KM (BCA) UCL	3.068
95% KM (t) UCL	2.795	95% KM (Percentile Bootstrap) UCL	2.947
95% KM (z) UCL	2.786	95% KM Bootstrap t UCL	22.51
90% KM Chebyshev UCL	3.897	95% KM Chebyshev UCL	5.01
97.5% KM Chebyshev UCL	6.556	99% KM Chebyshev UCL	9.591

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	7.151	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.885	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.322	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.14	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)	0.254	k star (bias corrected MLE)	0.252
Theta hat (MLE)	16.88	Theta star (bias corrected MLE)	17.01
nu hat (MLE)	24.41	nu star (bias corrected)	24.21
Mean (detects)	4.29		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0037	Mean	1.437
Maximum	99	Median	0.01
SD	9.764	CV	6.796
k hat (MLE)	0.191	k star (bias corrected MLE)	0.192
Theta hat (MLE)	7.514	Theta star (bias corrected MLE)	7.489
nu hat (MLE)	55.07	nu star (bias corrected)	55.25
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (55.25, α)	39.17	Adjusted Chi Square Value (55.25, β)	39.03
95% Gamma Approximate UCL (use when n>=50)	2.027	95% Gamma Adjusted UCL (use when n<50)	2.034

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.438	SD (KM)	9.73
Variance (KM)	94.67	SE of Mean (KM)	0.819
k hat (KM)	0.0218	k star (KM)	0.026
nu hat (KM)	6.293	nu star (KM)	7.495
theta hat (KM)	65.83	theta star (KM)	55.27
80% gamma percentile (KM)	0.00599	90% gamma percentile (KM)	0.558
95% gamma percentile (KM)	4.797	99% gamma percentile (KM)	38.44

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.49, α)	2.446	Adjusted Chi Square Value (7.49, β)	2.417
95% Gamma Approximate KM-UCL (use when n>=50)	4.407	95% Gamma Adjusted KM-UCL (use when n<50)	4.46

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.107	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.127	Detected Data appear 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	1.433	Mean in Log Scale	-4.722
SD in Original Scale	9.765	SD in Log Scale	2.91
95% t UCL (assumes normality of ROS data)	2.78	95% Percentile Bootstrap UCL	2.962
95% BCA Bootstrap UCL	3.495	95% Bootstrap t UCL	17.61
95% H-UCL (Log ROS)	1.803		

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ProUCL Output for Sitewide Soil Metals and Pesticides

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.235	KM Geo Mean	0.0145
KM SD (logged)	2.503	95% Critical H Value (KM-Log)	3.911
KM Standard Error of Mean (logged)	0.232	95% H-UCL (KM -Log)	0.754
KM SD (logged)	2.503	95% Critical H Value (KM-Log)	3.911
KM Standard Error of Mean (logged)	0.232		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.476	Mean in Log Scale	-3.098
SD in Original Scale	9.76	SD in Log Scale	2.11
95% t UCL (Assumes normality)	2.823	95% H-Stat UCL	0.765

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.754

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	144	Number of Distinct Observations	135
		Number of Missing Observations	0
Minimum	5.77	Mean	210.2
Maximum	2360	Median	87.95
SD	324.7	Std. Error of Mean	27.06
Coefficient of Variation	1.545	Skewness	3.63

Normal GOF Test

Shapiro Wilk Test Statistic	0.614	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.264	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0742	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)**

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ProUCL Output for Sitewide Soil Metals and Pesticides

95% Student's-t UCL	255	95% Adjusted-CLT UCL (Chen-1995)	263.4
		95% Modified-t UCL (Johnson-1978)	256.3

Gamma GOF Test

A-D Test Statistic	3.909	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.795	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.13	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0811	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.766	k star (bias corrected MLE)	0.755
Theta hat (MLE)	274.2	Theta star (bias corrected MLE)	278.3
nu hat (MLE)	220.7	nu star (bias corrected)	217.5
MLE Mean (bias corrected)	210.2	MLE Sd (bias corrected)	241.9
		Approximate Chi Square Value (0.05)	184.4
Adjusted Level of Significance	0.0483	Adjusted Chi Square Value	184

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	247.9	95% Adjusted Gamma UCL (use when n<50)	248.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.0262	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0965	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0742	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.753	Mean of logged Data	4.569
Maximum of Logged Data	7.766	SD of logged Data	1.243

Assuming Lognormal Distribution

95% H-UCL	269.2	90% Chebyshev (MVUE) UCL	290.7
95% Chebyshev (MVUE) UCL	328.7	97.5% Chebyshev (MVUE) UCL	381.3
99% Chebyshev (MVUE) UCL	484.6		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	254.7	95% Jackknife UCL	255
95% Standard Bootstrap UCL	254.3	95% Bootstrap-t UCL	267.9
95% Hall's Bootstrap UCL	268.9	95% Percentile Bootstrap UCL	255
95% BCA Bootstrap UCL	268.5		
90% Chebyshev(Mean, Sd) UCL	291.3	95% Chebyshev(Mean, Sd) UCL	328.1

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ProUCL Output for Sitewide Soil Metals and Pesticides

97.5% Chebyshev(Mean, Sd) UCL	379.1	99% Chebyshev(Mean, Sd) UCL	479.4

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ProUCL Output for Sitewide Soil Metals and Pesticides

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 328.1

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.

delta-BHC

General Statistics

Total Number of Observations	144	Number of Distinct Observations	57
Number of Detects	5	Number of Non-Detects	139
Number of Distinct Detects	5	Number of Distinct Non-Detects	53
Minimum Detect	0.024	Minimum Non-Detect	0.002
Maximum Detect	1.9	Maximum Non-Detect	4.9
Variance Detects	0.667	Percent Non-Detects	96.53%
Mean Detects	0.442	SD Detects	0.817
Median Detects	0.061	CV Detects	1.846
Skewness Detects	2.211	Kurtosis Detects	4.907
Mean of Logged Detects	-2.104	SD of Logged Detects	1.685

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.608	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.431	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	0.0187	KM Standard Error of Mean	0.0153
KM SD	0.161	95% KM (BCA) UCL	0.0497
95% KM (t) UCL	0.044	95% KM (Percentile Bootstrap) UCL	0.0458
95% KM (z) UCL	0.0438	95% KM Bootstrap t UCL	0.16
90% KM Chebyshev UCL	0.0646	95% KM Chebyshev UCL	0.0854
97.5% KM Chebyshev UCL	0.114	99% KM Chebyshev UCL	0.171

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.67	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.712	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.333	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.372	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

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ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Statistics on Detected Data Only

k hat (MLE)	0.494	k star (bias corrected MLE)	0.331
Theta hat (MLE)	0.896	Theta star (bias corrected MLE)	1.337
nu hat (MLE)	4.938	nu star (bias corrected)	3.309
Mean (detects)	0.442		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.025
Maximum	1.9	Median	0.01
SD	0.158	CV	6.317
k hat (MLE)	0.725	k star (bias corrected MLE)	0.714
Theta hat (MLE)	0.0345	Theta star (bias corrected MLE)	0.035
nu hat (MLE)	208.7	nu star (bias corrected)	205.7
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (205.68, α)	173.5	Adjusted Chi Square Value (205.68, β)	173.2
95% Gamma Approximate UCL (use when n>=50)	0.0297	95% Gamma Adjusted UCL (use when n<50)	0.0297

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0187	SD (KM)	0.161
Variance (KM)	0.026	SE of Mean (KM)	0.0153
k hat (KM)	0.0134	k star (KM)	0.0178
nu hat (KM)	3.865	nu star (KM)	5.117
theta hat (KM)	1.391	theta star (KM)	1.05
80% gamma percentile (KM)	2.1032E-6	90% gamma percentile (KM)	0.00159
95% gamma percentile (KM)	0.0344	99% gamma percentile (KM)	0.527

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.12, α)	1.207	Adjusted Chi Square Value (5.12, β)	1.188
95% Gamma Approximate KM-UCL (use when n>=50)	0.0791	95% Gamma Adjusted KM-UCL (use when n<50)	0.0804

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.26	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0155	Mean in Log Scale	-11
SD in Original Scale	0.159	SD in Log Scale	2.973
95% t UCL (assumes normality of ROS data)	0.0374	95% Percentile Bootstrap UCL	0.0414
95% BCA Bootstrap UCL	0.0564	95% Bootstrap t UCL	0.358
95% H-UCL (Log ROS)	0.00425		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-6.015	KM Geo Mean	0.00244
KM SD (logged)	0.901	95% Critical H Value (KM-Log)	2.114
KM Standard Error of Mean (logged)	0.0984	95% H-UCL (KM -Log)	0.0043
KM SD (logged)	0.901	95% Critical H Value (KM-Log)	2.114
KM Standard Error of Mean (logged)	0.0984		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.102	Mean in Log Scale	-3.783
SD in Original Scale	0.332	SD in Log Scale	1.553
95% t UCL (Assumes normality)	0.148	95% H-Stat UCL	0.109

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 Approximate Gamma UCL	0.0791

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.

Dieldrin

General Statistics

Total Number of Observations	144	Number of Distinct Observations	87
Number of Detects	43	Number of Non-Detects	101
Number of Distinct Detects	35	Number of Distinct Non-Detects	58
Minimum Detect	0.016	Minimum Non-Detect	0.0041
Maximum Detect	29	Maximum Non-Detect	4.5
Variance Detects	36.61	Percent Non-Detects	70.14%
Mean Detects	2.356	SD Detects	6.05
Median Detects	0.35	CV Detects	2.568
Skewness Detects	3.508	Kurtosis Detects	12.18
Mean of Logged Detects	-0.865	SD of Logged Detects	1.752

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.425	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.943	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.417	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.134	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

KM Mean	0.718	KM Standard Error of Mean	0.29
KM SD	3.438	95% KM (BCA) UCL	1.259
95% KM (t) UCL	1.198	95% KM (Percentile Bootstrap) UCL	1.234
95% KM (z) UCL	1.195	95% KM Bootstrap t UCL	1.723
90% KM Chebyshev UCL	1.588	95% KM Chebyshev UCL	1.982
97.5% KM Chebyshev UCL	2.529	99% KM Chebyshev UCL	3.603

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.613	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.84	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.145	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)	0.385	k star (bias corrected MLE)	0.373
Theta hat (MLE)	6.125	Theta star (bias corrected MLE)	6.31
nu hat (MLE)	33.08	nu star (bias corrected)	32.1
Mean (detects)	2.356		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.71
Maximum	29	Median	0.01
SD	3.451	CV	4.858
k hat (MLE)	0.229	k star (bias corrected MLE)	0.229
Theta hat (MLE)	3.103	Theta star (bias corrected MLE)	3.105
nu hat (MLE)	65.94	nu star (bias corrected)	65.9
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (65.90, α)	48.22	Adjusted Chi Square Value (65.90, β)	48.07
95% Gamma Approximate UCL (use when n>=50)	0.971	95% Gamma Adjusted UCL (use when n<50)	0.974

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.718	SD (KM)	3.438
Variance (KM)	11.82	SE of Mean (KM)	0.29
k hat (KM)	0.0436	k star (KM)	0.0473
nu hat (KM)	12.56	nu star (KM)	13.63
theta hat (KM)	16.47	theta star (KM)	15.17
80% gamma percentile (KM)	0.0797	90% gamma percentile (KM)	1.017
95% gamma percentile (KM)	3.739	99% gamma percentile (KM)	15.96

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.63, α)	6.318	Adjusted Chi Square Value (13.63, β)	6.268
95% Gamma Approximate KM-UCL (use when n>=50)	1.549	95% Gamma Adjusted KM-UCL (use when n<50)	1.561

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.943	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0973	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.134	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	0.708	Mean in Log Scale	-4.147
SD in Original Scale	3.452	SD in Log Scale	2.54
95% t UCL (assumes normality of ROS data)	1.185	95% Percentile Bootstrap UCL	1.217
95% BCA Bootstrap UCL	1.412	95% Bootstrap t UCL	1.799
95% H-UCL (Log ROS)	0.922		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.767	KM Geo Mean	0.0231
KM SD (logged)	2.294	95% Critical H Value (KM-Log)	3.647
KM Standard Error of Mean (logged)	0.224	95% H-UCL (KM -Log)	0.646
KM SD (logged)	2.294	95% Critical H Value (KM-Log)	3.647
KM Standard Error of Mean (logged)	0.224		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.799	Mean in Log Scale	-2.516
SD in Original Scale	3.447	SD in Log Scale	1.911
95% t UCL (Assumes normality)	1.275	95% H-Stat UCL	0.832

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

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Suggested UCL to Use

KM H-UCL 0.646

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.

gamma-BHC (Lindane)

General Statistics

Total Number of Observations	144	Number of Distinct Observations	58
Number of Detects	9	Number of Non-Detects	135
Number of Distinct Detects	9	Number of Distinct Non-Detects	52
Minimum Detect	0.031	Minimum Non-Detect	0.002
Maximum Detect	0.99	Maximum Non-Detect	4.9
Variance Detects	0.0971	Percent Non-Detects	93.75%
Mean Detects	0.226	SD Detects	0.312
Median Detects	0.11	CV Detects	1.378
Skewness Detects	2.292	Kurtosis Detects	5.263
Mean of Logged Detects	-2.09	SD of Logged Detects	1.082

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.652	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	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

KM Mean	0.0179	KM Standard Error of Mean	0.00846
KM SD	0.0933	95% KM (BCA) UCL	0.0318
95% KM (t) UCL	0.0319	95% KM (Percentile Bootstrap) UCL	0.0323
95% KM (z) UCL	0.0318	95% KM Bootstrap t UCL	0.0573
90% KM Chebyshev UCL	0.0433	95% KM Chebyshev UCL	0.0548
97.5% KM Chebyshev UCL	0.0707	99% KM Chebyshev UCL	0.102

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.736	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.287	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.287	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

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ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Statistics on Detected Data Only

k hat (MLE)	0.961	k star (bias corrected MLE)	0.715
Theta hat (MLE)	0.235	Theta star (bias corrected MLE)	0.317
nu hat (MLE)	17.29	nu star (bias corrected)	12.86
Mean (detects)	0.226		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0235
Maximum	0.99	Median	0.01
SD	0.0905	CV	3.849
k hat (MLE)	0.845	k star (bias corrected MLE)	0.832
Theta hat (MLE)	0.0278	Theta star (bias corrected MLE)	0.0283
nu hat (MLE)	243.2	nu star (bias corrected)	239.5
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (239.50, α)	204.7	Adjusted Chi Square Value (239.50, β)	204.3
95% Gamma Approximate UCL (use when n>=50)	0.0275	95% Gamma Adjusted UCL (use when n<50)	0.0276

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0179	SD (KM)	0.0933
Variance (KM)	0.0087	SE of Mean (KM)	0.00846
k hat (KM)	0.0368	k star (KM)	0.0406
nu hat (KM)	10.59	nu star (KM)	11.7
theta hat (KM)	0.487	theta star (KM)	0.44
80% gamma percentile (KM)	0.00105	90% gamma percentile (KM)	0.0199
95% gamma percentile (KM)	0.0865	99% gamma percentile (KM)	0.42

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.70, α)	5.029	Adjusted Chi Square Value (11.70, β)	4.984
95% Gamma Approximate KM-UCL (use when n>=50)	0.0416	95% Gamma Adjusted KM-UCL (use when n<50)	0.042

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.274	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	0.0157	Mean in Log Scale	-7.073
SD in Original Scale	0.0917	SD in Log Scale	1.959
95% t UCL (assumes normality of ROS data)	0.0284	95% Percentile Bootstrap UCL	0.029

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ProUCL Output for Sitewide Soil Metals and Pesticides

95% BCA Bootstrap UCL	0.0399	95% Bootstrap t UCL	0.0674
95% H-UCL (Log ROS)	0.00981		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.874	KM Geo Mean	0.00281
KM SD (logged)	1.142	95% Critical H Value (KM-Log)	2.334
KM Standard Error of Mean (logged)	0.116	95% H-UCL (KM -Log)	0.00675
KM SD (logged)	1.142	95% Critical H Value (KM-Log)	2.334
KM Standard Error of Mean (logged)	0.116		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0993	Mean in Log Scale	-3.749
SD in Original Scale	0.306	SD in Log Scale	1.567
95% t UCL (Assumes normality)	0.142	95% H-Stat UCL	0.116

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 Approximate Gamma UCL	0.0416

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.

gamma-Chlordane

General Statistics

Total Number of Observations	144	Number of Distinct Observations	68
Number of Detects	37	Number of Non-Detects	107
Number of Distinct Detects	34	Number of Distinct Non-Detects	44
Minimum Detect	0.016	Minimum Non-Detect	0.0021
Maximum Detect	69	Maximum Non-Detect	2.3
Variance Detects	133	Percent Non-Detects	74.31%
Mean Detects	2.918	SD Detects	11.53
Median Detects	0.16	CV Detects	3.952
Skewness Detects	5.565	Kurtosis Detects	32.17
Mean of Logged Detects	-1.336	SD of Logged Detects	1.914

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.271	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.936	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.406	**Lilliefors GOF Test**	

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ProUCL Output for Sitewide Soil Metals and Pesticides

5% Lilliefors Critical Value	0.144	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

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ProUCL Output for Sitewide Soil Metals and Pesticides

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.757	KM Standard Error of Mean	0.499
KM SD	5.905	95% KM (BCA) UCL	1.677
95% KM (t) UCL	1.583	95% KM (Percentile Bootstrap) UCL	1.712
95% KM (z) UCL	1.577	95% KM Bootstrap t UCL	7.733
90% KM Chebyshev UCL	2.253	95% KM Chebyshev UCL	2.931
97.5% KM Chebyshev UCL	3.872	99% KM Chebyshev UCL	5.721

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.117	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.863	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.253	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.158	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)	0.288	k star (bias corrected MLE)	0.283
Theta hat (MLE)	10.12	Theta star (bias corrected MLE)	10.31
nu hat (MLE)	21.34	nu star (bias corrected)	20.94
Mean (detects)	2.918		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.757
Maximum	69	Median	0.01
SD	5.926	CV	7.825
k hat (MLE)	0.21	k star (bias corrected MLE)	0.21
Theta hat (MLE)	3.615	Theta star (bias corrected MLE)	3.61
nu hat (MLE)	60.34	nu star (bias corrected)	60.41
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (60.41, α)	43.54	Adjusted Chi Square Value (60.41, β)	43.4
95% Gamma Approximate UCL (use when n>=50)	1.051	95% Gamma Adjusted UCL (use when n<50)	1.054

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.757	SD (KM)	5.905
Variance (KM)	34.87	SE of Mean (KM)	0.499
k hat (KM)	0.0164	k star (KM)	0.0207
nu hat (KM)	4.727	nu star (KM)	5.961
theta hat (KM)	46.1	theta star (KM)	36.55
80% gamma percentile (KM)	4.3425E-4	90% gamma percentile (KM)	0.129
95% gamma percentile (KM)	1.839	99% gamma percentile (KM)	21.05

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ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.96, α)	1.62	Adjusted Chi Square Value (5.96, β)	1.598
95% Gamma Approximate KM-UCL (use when n>=50)	2.784	95% Gamma Adjusted KM-UCL (use when n<50)	2.823

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.936	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.132	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.144	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	0.752	Mean in Log Scale	-5.524
SD in Original Scale	5.927	SD in Log Scale	3.016
95% t UCL (assumes normality of ROS data)	1.57	95% Percentile Bootstrap UCL	1.668
95% BCA Bootstrap UCL	2.549	95% Bootstrap t UCL	7.582
95% H-UCL (Log ROS)	1.193		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.655	KM Geo Mean	0.00951
KM SD (logged)	2.335	95% Critical H Value (KM-Log)	3.699
KM Standard Error of Mean (logged)	0.22	95% H-UCL (KM -Log)	0.299
KM SD (logged)	2.335	95% Critical H Value (KM-Log)	3.699
KM Standard Error of Mean (logged)	0.22		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.792	Mean in Log Scale	-3.292
SD in Original Scale	5.923	SD in Log Scale	1.942
95% t UCL (Assumes normality)	1.609	95% H-Stat UCL	0.413

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

KM H-UCL	0.299

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.

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Heptachlor

General Statistics

Total Number of Observations	144	Number of Distinct Observations	58
Number of Detects	10	Number of Non-Detects	134
Number of Distinct Detects	10	Number of Distinct Non-Detects	51
Minimum Detect	0.012	Minimum Non-Detect	0.002
Maximum Detect	41	Maximum Non-Detect	2.3
Variance Detects	187.8	Percent Non-Detects	93.06%
Mean Detects	6.635	SD Detects	13.7
Median Detects	0.385	CV Detects	2.065
Skewness Detects	2.247	Kurtosis Detects	4.63
Mean of Logged Detects	-0.628	SD of Logged Detects	2.56

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.569	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.41	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	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

KM Mean	0.464	KM Standard Error of Mean	0.335
KM SD	3.818	95% KM (BCA) UCL	1.037
95% KM (t) UCL	1.019	95% KM (Percentile Bootstrap) UCL	1.045
95% KM (z) UCL	1.015	95% KM Bootstrap t UCL	7.294
90% KM Chebyshev UCL	1.47	95% KM Chebyshev UCL	1.926
97.5% KM Chebyshev UCL	2.558	99% KM Chebyshev UCL	3.801

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.889	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.823	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.339	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.289	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)	0.277	k star (bias corrected MLE)	0.261
Theta hat (MLE)	23.94	Theta star (bias corrected MLE)	25.45
nu hat (MLE)	5.543	nu star (bias corrected)	5.213
Mean (detects)	6.635		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.47
Maximum	41	Median	0.01
SD	3.831	CV	8.15
k hat (MLE)	0.205	k star (bias corrected MLE)	0.205
Theta hat (MLE)	2.292	Theta star (bias corrected MLE)	2.288
nu hat (MLE)	59.07	nu star (bias corrected)	59.17
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (59.17, α)	42.48	Adjusted Chi Square Value (59.17, β)	42.34
95% Gamma Approximate UCL (use when n>=50)	0.655	95% Gamma Adjusted UCL (use when n<50)	0.657

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.464	SD (KM)	3.818
Variance (KM)	14.58	SE of Mean (KM)	0.335
k hat (KM)	0.0147	k star (KM)	0.0191
nu hat (KM)	4.247	nu star (KM)	5.492
theta hat (KM)	31.44	theta star (KM)	24.32
80% gamma percentile (KM)	1.1478E-4	90% gamma percentile (KM)	0.0554
95% gamma percentile (KM)	0.979	99% gamma percentile (KM)	13.02

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.49, α)	1.386	Adjusted Chi Square Value (5.49, β)	1.366
95% Gamma Approximate KM-UCL (use when n>=50)	1.837	95% Gamma Adjusted KM-UCL (use when n<50)	1.865

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.941	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.237	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	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	0.461	Mean in Log Scale	-13.07
SD in Original Scale	3.832	SD in Log Scale	4.996
95% t UCL (assumes normality of ROS data)	0.99	95% Percentile Bootstrap UCL	1.04
95% BCA Bootstrap UCL	1.463	95% Bootstrap t UCL	7.544
95% H-UCL (Log ROS)	11.43		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.748	KM Geo Mean	0.00319
KM SD (logged)	1.599	95% Critical H Value (KM-Log)	2.816
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	0.0167
KM SD (logged)	1.599	95% Critical H Value (KM-Log)	2.816
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.516	Mean in Log Scale	-3.681
SD in Original Scale	3.828	SD in Log Scale	1.736
95% t UCL (Assumes normality)	1.045	95% H-Stat UCL	0.175

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

KM H-UCL 0.0167

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.

Lead

General Statistics

Total Number of Observations	144	Number of Distinct Observations	133
		Number of Missing Observations	0
Minimum	14.9	Mean	2612
Maximum	78400	Median	393.5
SD	9372	Std. Error of Mean	781
Coefficient of Variation	3.588	Skewness	6.591

Normal GOF Test

Shapiro Wilk Test Statistic	0.284	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.391	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0742	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	3905	95% Adjusted-CLT UCL (Chen-1995)	4355
		95% Modified-t UCL (Johnson-1978)	3977

Gamma GOF Test

A-D Test Statistic	9.163	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.847	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.18	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.0838	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.386	k star (bias corrected MLE)	0.383
Theta hat (MLE)	6765	Theta star (bias corrected MLE)	6825
nu hat (MLE)	111.2	nu star (bias corrected)	110.2
MLE Mean (bias corrected)	2612	MLE Sd (bias corrected)	4223
		Approximate Chi Square Value (0.05)	87
Adjusted Level of Significance	0.0483	Adjusted Chi Square Value	86.79

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3310	95% Adjusted Gamma UCL (use when n<50)	3318

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0.0219	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.055	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.0742	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.701	Mean of logged Data	6.154
Maximum of Logged Data	11.27	SD of logged Data	1.702

Assuming Lognormal Distribution

95% H-UCL	3039	90% Chebyshev (MVUE) UCL	3196
95% Chebyshev (MVUE) UCL	3758	97.5% Chebyshev (MVUE) UCL	4539
99% Chebyshev (MVUE) UCL	6072		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Nonparametric Distribution Free UCLs

95% CLT UCL	3897	95% Jackknife UCL	3905
95% Standard Bootstrap UCL	3887	95% Bootstrap-t UCL	6123
95% Hall's Bootstrap UCL	4454	95% Percentile Bootstrap UCL	3909
95% BCA Bootstrap UCL	4365		
90% Chebyshev(Mean, Sd) UCL	4955	95% Chebyshev(Mean, Sd) UCL	6017
97.5% Chebyshev(Mean, Sd) UCL	7490	99% Chebyshev(Mean, Sd) UCL	10383

Suggested UCL to Use

95% H-UCL 3039

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Methoxychlor

General Statistics

Total Number of Observations	144	Number of Distinct Observations	55
Number of Detects	0	Number of Non-Detects	144
Number of Distinct Detects	0	Number of Distinct Non-Detects	55

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor was not processed!

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Toxaphene

General Statistics

Total Number of Observations	144	Number of Distinct Observations	65
Number of Detects	15	Number of Non-Detects	129
Number of Distinct Detects	14	Number of Distinct Non-Detects	56
Minimum Detect	0.25	Minimum Non-Detect	0.21
Maximum Detect	21	Maximum Non-Detect	2100
Variance Detects	47.15	Percent Non-Detects	89.58%
Mean Detects	7.645	SD Detects	6.867
Median Detects	4.8	CV Detects	0.898
Skewness Detects	0.706	Kurtosis Detects	-0.814
Mean of Logged Detects	1.41	SD of Logged Detects	1.387

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	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

KM Mean	1.408	KM Standard Error of Mean	0.363
KM SD	3.559	95% KM (BCA) UCL	2.034
95% KM (t) UCL	2.009	95% KM (Percentile Bootstrap) UCL	2.028
95% KM (z) UCL	2.005	95% KM Bootstrap t UCL	2.168
90% KM Chebyshev UCL	2.498	95% KM Chebyshev UCL	2.992
97.5% KM Chebyshev UCL	3.677	99% KM Chebyshev UCL	5.023

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.333	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.766	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.14	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.229	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)	0.933	k star (bias corrected MLE)	0.791
Theta hat (MLE)	8.193	Theta star (bias corrected MLE)	9.666
nu hat (MLE)	28	nu star (bias corrected)	23.73
Mean (detects)	7.645		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.872
Maximum	21	Median	0.01
SD	3.193	CV	3.66
k hat (MLE)	0.201	k star (bias corrected MLE)	0.202
Theta hat (MLE)	4.338	Theta star (bias corrected MLE)	4.328
nu hat (MLE)	57.91	nu star (bias corrected)	58.04
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (58.04, α)	41.52	Adjusted Chi Square Value (58.04, β)	41.38
95% Gamma Approximate UCL (use when n>=50)	1.219	95% Gamma Adjusted UCL (use when n<50)	1.223

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.408	SD (KM)	3.559
Variance (KM)	12.67	SE of Mean (KM)	0.363
k hat (KM)	0.156	k star (KM)	0.158
nu hat (KM)	45.06	nu star (KM)	45.46
theta hat (KM)	8.997	theta star (KM)	8.919
80% gamma percentile (KM)	1.595	90% gamma percentile (KM)	4.201
95% gamma percentile (KM)	7.669	99% gamma percentile (KM)	17.63

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (45.46, α)	30.99	Adjusted Chi Square Value (45.46, β)	30.87
95% Gamma Approximate KM-UCL (use when n>=50)	2.065	95% Gamma Adjusted KM-UCL (use when n<50)	2.073

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	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	0.989	Mean in Log Scale	-1.844
SD in Original Scale	3.146	SD in Log Scale	1.65
95% t UCL (assumes normality of ROS data)	1.423	95% Percentile Bootstrap UCL	1.448
95% BCA Bootstrap UCL	1.579	95% Bootstrap t UCL	1.646
95% H-UCL (Log ROS)	0.917		

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.914	KM Geo Mean	0.401
KM SD (logged)	1.211	95% Critical H Value (KM-Log)	2.401
KM Standard Error of Mean (logged)	0.159	95% H-UCL (KM -Log)	1.064
KM SD (logged)	1.211	95% Critical H Value (KM-Log)	2.401
KM Standard Error of Mean (logged)	0.159		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	19.77	Mean in Log Scale	1.111
SD in Original Scale	92.49	SD in Log Scale	1.709
95% t UCL (Assumes normality)	32.53	95% H-Stat UCL	19.9

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	2.009

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.

Zinc

General Statistics

Total Number of Observations	144	Number of Distinct Observations	137
Number of Detects	142	Number of Non-Detects	2
Number of Distinct Detects	136	Number of Distinct Non-Detects	2
Minimum Detect	32.7	Minimum Non-Detect	96.5
Maximum Detect	4730	Maximum Non-Detect	111
Variance Detects	489539	Percent Non-Detects	1.389%
Mean Detects	546.2	SD Detects	699.7
Median Detects	361	CV Detects	1.281
Skewness Detects	3.717	Kurtosis Detects	17.56
Mean of Logged Detects	5.787	SD of Logged Detects	1.017

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.625	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.231	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0747	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	539.6	KM Standard Error of Mean	58.09
KM SD	694.6	95% KM (BCA) UCL	644.5
95% KM (t) UCL	635.8	95% KM (Percentile Bootstrap) UCL	640
95% KM (z) UCL	635.2	95% KM Bootstrap t UCL	666.8
90% KM Chebyshev UCL	713.9	95% KM Chebyshev UCL	792.8
97.5% KM Chebyshev UCL	902.4	99% KM Chebyshev UCL	1118

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.013	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.781	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0976	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.0808	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)	1.105	k star (bias corrected MLE)	1.087
Theta hat (MLE)	494.2	Theta star (bias corrected MLE)	502.6
nu hat (MLE)	313.9	nu star (bias corrected)	308.6
Mean (detects)	546.2		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	538.7
Maximum	4730	Median	358.5
SD	697.7	CV	1.295
k hat (MLE)	0.904	k star (bias corrected MLE)	0.889
Theta hat (MLE)	596.1	Theta star (bias corrected MLE)	605.6
nu hat (MLE)	260.3	nu star (bias corrected)	256.2
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (256.17, α)	220.1	Adjusted Chi Square Value (256.17, β)	219.8
95% Gamma Approximate UCL (use when n>=50)	626.9	95% Gamma Adjusted UCL (use when n<50)	627.9

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	539.6	SD (KM)	694.6
Variance (KM)	482445	SE of Mean (KM)	58.09
k hat (KM)	0.604	k star (KM)	0.596
nu hat (KM)	173.8	nu star (KM)	171.6
theta hat (KM)	894	theta star (KM)	905.9
80% gamma percentile (KM)	889.5	90% gamma percentile (KM)	1406
95% gamma percentile (KM)	1947	99% gamma percentile (KM)	3256

Attachemnt A-1b

ProUCL Output for Sitewide Soil Metals and Pesticides

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (171.55, α)	142.3	Adjusted Chi Square Value (171.55, β)	142
95% Gamma Approximate KM-UCL (use when n>=50)	650.7	95% Gamma Adjusted KM-UCL (use when n<50)	652

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.973	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.123	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.063	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0747	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	539.6	Mean in Log Scale	5.765
SD in Original Scale	697	SD in Log Scale	1.027
95% t UCL (assumes normality of ROS data)	635.8	95% Percentile Bootstrap UCL	638.1
95% BCA Bootstrap UCL	664.1	95% Bootstrap t UCL	660.7
95% H-UCL (Log ROS)	654.1		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.765	KM Geo Mean	318.9
KM SD (logged)	1.024	95% Critical H Value (KM-Log)	2.223
KM Standard Error of Mean (logged)	0.0858	95% H-UCL (KM -Log)	652
KM SD (logged)	1.024	95% Critical H Value (KM-Log)	2.223
KM Standard Error of Mean (logged)	0.0858		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	539.4	Mean in Log Scale	5.761
SD in Original Scale	697.2	SD in Log Scale	1.033
95% t UCL (Assumes normality)	635.6	95% H-Stat UCL	657

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

KM H-UCL 652

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.

ATTACHMENT A-2

ProUCL Calculations - Site-wide Sediment

A-2a ProUCL Data Set for Site-wide Sediment

A-2b ProUCL Output for Site-wide Sediment Metals

A-2c ProUCL Output for Site-wide Sediment Pesticides

Attachment A-2a
ProUCL Data Set for Sitewide Sediment

SID	Main Point	SED-101	SED-102	SED-103	SED-104	SED-105
Sample Date	38133.5	36545.5	36545.5	36545.5	36545.5	36545.5
UOM	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
4,4'-DDD	0.01	0.0091	0.0025	0.0086	0.89	0.052
D_4,4'-DDD	0	1	1	1	1	1
4,4'-DDE	0.01	0.0032	0.002	0.0021	0.034	0.0095
D_4,4'-DDE	0	1	0	1	1	1
4,4'-DDT	0.01	0.0069	0.002	0.0041	0.34	0.055
D_4,4'-DDT	0	1	0	1	1	1
alpha-BHC	0.016	0.002	0.002	0.002	0.054	0.011
D_alpha-BHC	1	0	0	0	1	1
Arsenic	7.7	50.7	4.4	6.1	7.7	10.4
D_Arsenic	1	1	1	1	1	1
beta-BHC	0.065	0.002	0.002	0.0024	0.027	0.011
D_beta-BHC	1	0	0	1	1	1
Chlordane	0.054	0.002	0.002	0.002	0.062	0.012
D_Chlordane	0	0	0	0	1	1
delta-BHC	0.022	0.002	0.002	0.002	0.029	0.0076
D_delta-BHC	1	0	0	0	1	1
Dieldrin	0.011	0.0032	0.002	0.002	0.088	0.012
D_Dieldrin	1	1	0	0	1	1
gamma-BHC (Lindane)	0.0085	0.002	0.002	0.002	0.03	0.0067
D_gamma-BHC (Lindane)	1	0	0	0	1	1
Heptachlor	0.0054	0.002	0.002	0.002	0.0049	0.002
D_Heptachlor	0	0	0	0	1	0
Lead	36	66.1	30.9	52.9	91.5	34.7
D_Lead	1	1	1	1	1	1
Methoxychlor	0.054	0.002	0.002	0.002	0.0083	0.002
D_Methoxychlor	0	0	0	0	0	0
Toxaphene	0.54	0.05	0.05	0.05	0.17	0.05
D_Toxaphene	0	0	0	0	0	0

Attachment A-2b
ProUCL Output for Sitewide Metals in Sediment

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/31/2018 3:40:51 PM
From File	2018_05_21 Eco SED ('00+'04) ProUCL input - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	4.4	Mean	14.5
Maximum	50.7	Median	7.7
SD	17.85	Std. Error of Mean	7.285
Coefficient of Variation	1.231	Skewness	2.382

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.603	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.424	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	29.18	95% Adjusted-CLT UCL (Chen-1995)	34.05
		95% Modified-t UCL (Johnson-1978)	30.36

Gamma GOF Test

A-D Test Statistic	0.91	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.709	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.365	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.338	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Attachment A-2b
ProUCL Output for Sitewide Metals in Sediment

Gamma Statistics

k hat (MLE)	1.391	k star (bias corrected MLE)	0.806
Theta hat (MLE)	10.43	Theta star (bias corrected MLE)	17.98
nu hat (MLE)	16.69	nu star (bias corrected)	9.677
MLE Mean (bias corrected)	14.5	MLE Sd (bias corrected)	16.15
		Approximate Chi Square Value (0.05)	3.741
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	2.536

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	37.51	95% Adjusted Gamma UCL (use when n<50)	55.34

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.804	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.302	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.482	Mean of logged Data	2.273
Maximum of Logged Data	3.926	SD of logged Data	0.859

Assuming Lognormal Distribution

95% H-UCL	57.03	90% Chebyshev (MVUE) UCL	26.62
95% Chebyshev (MVUE) UCL	32.77	97.5% Chebyshev (MVUE) UCL	41.31
99% Chebyshev (MVUE) UCL	58.08		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	26.48	95% Jackknife UCL	29.18
95% Standard Bootstrap UCL	25.38	95% Bootstrap-t UCL	116.5
95% Hall's Bootstrap UCL	110.5	95% Percentile Bootstrap UCL	28.38
95% BCA Bootstrap UCL	35.83		
90% Chebyshev(Mean, Sd) UCL	36.36	95% Chebyshev(Mean, Sd) UCL	46.26
97.5% Chebyshev(Mean, Sd) UCL	60	99% Chebyshev(Mean, Sd) UCL	86.99

Attachment A-2b
ProUCL Output for Sitewide Metals in Sediment

Suggested UCL to Use

95% H-UCL 57.03

Recommended UCL exceeds the maximum observation

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Lead

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	30.9	Mean	52.02
Maximum	91.5	Median	44.45
SD	23.5	Std. Error of Mean	9.592
Coefficient of Variation	0.452	Skewness	1.055

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.879	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	71.35	95% Adjusted-CLT UCL (Chen-1995)	72.21
		95% Modified-t UCL (Johnson-1978)	72.03

Gamma GOF Test

A-D Test Statistic	0.371	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level

Attachment A-2b
ProUCL Output for Sitewide Metals in Sediment

K-S Test Statistic	0.273	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.512	k star (bias corrected MLE)	3.367
Theta hat (MLE)	7.988	Theta star (bias corrected MLE)	15.45
nu hat (MLE)	78.14	nu star (bias corrected)	40.4
MLE Mean (bias corrected)	52.02	MLE Sd (bias corrected)	28.35
		Approximate Chi Square Value (0.05)	26.84
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	22.93

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	78.31	95% Adjusted Gamma UCL (use when n<50)	91.67

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.251	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.431	Mean of logged Data	3.873
Maximum of Logged Data	4.516	SD of logged Data	0.427

Assuming Lognormal Distribution

95% H-UCL	84.38	90% Chebyshev (MVUE) UCL	78.88
95% Chebyshev (MVUE) UCL	91.14	97.5% Chebyshev (MVUE) UCL	108.2
99% Chebyshev (MVUE) UCL	141.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	67.79	95% Jackknife UCL	71.35
95% Standard Bootstrap UCL	66.37	95% Bootstrap-t UCL	80.52
95% Hall's Bootstrap UCL	82.81	95% Percentile Bootstrap UCL	67.92
95% BCA Bootstrap UCL	69.38		
90% Chebyshev(Mean, Sd) UCL	80.79	95% Chebyshev(Mean, Sd) UCL	93.83
97.5% Chebyshev(Mean, Sd) UCL	111.9	99% Chebyshev(Mean, Sd) UCL	147.5

Suggested UCL to Use

95% Student's-t UCL	71.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Attachment A-2b
ProUCL Output for Sitewide Metals in Sediment

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.

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/31/2018 3:41:34 PM
From File	2018_05_21 Eco SED ('00+'04) ProUCL input - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	1
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.0025	Minimum Non-Detect	0.01
Maximum Detect	0.89	Maximum Non-Detect	0.01
Variance Detects	0.152	Percent Non-Detects	16.67%
Mean Detects	0.192	SD Detects	0.39
Median Detects	0.0091	CV Detects	2.029
Skewness Detects	2.222	Kurtosis Detects	4.948
Mean of Logged Detects	-3.704	SD of Logged Detects	2.278

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.591	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.44	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.161	KM Standard Error of Mean	0.149
KM SD	0.326	95% KM (BCA) UCL	0.449
95% KM (t) UCL	0.462	95% KM (Percentile Bootstrap) UCL	0.324
95% KM (z) UCL	0.406	95% KM Bootstrap t UCL	15.19
90% KM Chebyshev UCL	0.608	95% KM Chebyshev UCL	0.811
97.5% KM Chebyshev UCL	1.091	99% KM Chebyshev UCL	1.643

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.624	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.318	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.379	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)	0.33	k star (bias corrected MLE)	0.265
Theta hat (MLE)	0.583	Theta star (bias corrected MLE)	0.725
nu hat (MLE)	3.302	nu star (bias corrected)	2.654
Mean (detects)	0.192		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0025	Mean	0.162
Maximum	0.89	Median	0.00955
SD	0.357	CV	2.204
k hat (MLE)	0.333	k star (bias corrected MLE)	0.278
Theta hat (MLE)	0.486	Theta star (bias corrected MLE)	0.583
nu hat (MLE)	3.999	nu star (bias corrected)	3.333
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (3.33, α)	0.477	Adjusted Chi Square Value (3.33, β)	0.218
95% Gamma Approximate UCL (use when n>=50)	1.131	95% Gamma Adjusted UCL (use when n<50)	2.476

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.161	SD (KM)	0.326
Variance (KM)	0.106	SE of Mean (KM)	0.149
k hat (KM)	0.245	k star (KM)	0.234
nu hat (KM)	2.941	nu star (KM)	2.804
theta hat (KM)	0.659	theta star (KM)	0.691
80% gamma percentile (KM)	0.229	90% gamma percentile (KM)	0.487
95% gamma percentile (KM)	0.797	99% gamma percentile (KM)	1.632

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.80, α)	0.317	Adjusted Chi Square Value (2.80, β)	0.143
95% Gamma Approximate KM-UCL (use when n>=50)	1.43	95% Gamma Adjusted KM-UCL (use when n<50)	3.174

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.269	**Lilliefors GOF Test**

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

5% Lilliefors Critical Value	0.343	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	0.161	Mean in Log Scale	-3.927
SD in Original Scale	0.357	SD in Log Scale	2.109
95% t UCL (assumes normality of ROS data)	0.455	95% Percentile Bootstrap UCL	0.448
95% BCA Bootstrap UCL	0.596	95% Bootstrap t UCL	21.81
95% H-UCL (Log ROS)	380.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.945	KM Geo Mean	0.0194
KM SD (logged)	1.952	95% Critical H Value (KM-Log)	7.523
KM Standard Error of Mean (logged)	0.9	95% H-UCL (KM -Log)	92.41
KM SD (logged)	1.952	95% Critical H Value (KM-Log)	7.523
KM Standard Error of Mean (logged)	0.9		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.161	Mean in Log Scale	-3.97
SD in Original Scale	0.358	SD in Log Scale	2.139
95% t UCL (Assumes normality)	0.455	95% H-Stat UCL	479.9

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 Bootstrap t UCL	15.19	ıa Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	3.174

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.

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

4,4'-DDE

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.0021	Minimum Non-Detect	0.002
Maximum Detect	0.034	Maximum Non-Detect	0.01
Variance Detects	2.2185E-4	Percent Non-Detects	33.33%
Mean Detects	0.0122	SD Detects	0.0149
Median Detects	0.00635	CV Detects	1.221
Skewness Detects	1.731	Kurtosis Detects	2.949
Mean of Logged Detects	-4.987	SD of Logged Detects	1.245

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.793	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.322	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.00917	KM Standard Error of Mean	0.00544
KM SD	0.0115	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0201	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0181	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0255	95% KM Chebyshev UCL	0.0329
97.5% KM Chebyshev UCL	0.0432	99% KM Chebyshev UCL	0.0633

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.348	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.667	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.268	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.403	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)	0.995	k star (bias corrected MLE)	0.415
Theta hat (MLE)	0.0123	Theta star (bias corrected MLE)	0.0294
nu hat (MLE)	7.956	nu star (bias corrected)	3.322
Mean (detects)	0.0122		

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0021	Mean	0.0115
Maximum	0.034	Median	0.00975
SD	0.0116	CV	1.011
k hat (MLE)	1.421	k star (bias corrected MLE)	0.822
Theta hat (MLE)	0.00807	Theta star (bias corrected MLE)	0.014
nu hat (MLE)	17.05	nu star (bias corrected)	9.859
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (9.86, α)	3.854	Adjusted Chi Square Value (9.86, β)	2.625
95% Gamma Approximate UCL (use when n>=50)	0.0293	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00917	SD (KM)	0.0115
Variance (KM)	1.3133E-4	SE of Mean (KM)	0.00544
k hat (KM)	0.64	k star (KM)	0.431
nu hat (KM)	7.678	nu star (KM)	5.172
theta hat (KM)	0.0143	theta star (KM)	0.0213
80% gamma percentile (KM)	0.0149	90% gamma percentile (KM)	0.0255
95% gamma percentile (KM)	0.0371	99% gamma percentile (KM)	0.066

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.17, α)	1.233	Adjusted Chi Square Value (5.17, β)	0.672
95% Gamma Approximate KM-UCL (use when n>=50)	0.0385	95% Gamma Adjusted KM-UCL (use when n<50)	0.0705

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.229	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.00863	Mean in Log Scale	-5.609
SD in Original Scale	0.0128	SD in Log Scale	1.471
95% t UCL (assumes normality of ROS data)	0.0192	95% Percentile Bootstrap UCL	0.018
95% BCA Bootstrap UCL	0.0205	95% Bootstrap t UCL	0.0887
95% H-UCL (Log ROS)	0.482		

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.31	KM Geo Mean	0.00494
KM SD (logged)	1.035	95% Critical H Value (KM-Log)	4.251
KM Standard Error of Mean (logged)	0.506	95% H-UCL (KM -Log)	0.0604
KM SD (logged)	1.035	95% Critical H Value (KM-Log)	4.251
KM Standard Error of Mean (logged)	0.506		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.00913	Mean in Log Scale	-5.359
SD in Original Scale	0.0125	SD in Log Scale	1.233
95% t UCL (Assumes normality)	0.0195	95% H-Stat UCL	0.153

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 0.0201

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	6	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.0041	Minimum Non-Detect	0.002
Maximum Detect	0.34	Maximum Non-Detect	0.01
Variance Detects	0.0258	Percent Non-Detects	33.33%
Mean Detects	0.102	SD Detects	0.161
Median Detects	0.031	CV Detects	1.583
Skewness Detects	1.879	Kurtosis Detects	3.543
Mean of Logged Detects	-3.613	SD of Logged Detects	2.028

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.737	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.364	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.0687	KM Standard Error of Mean	0.0579
KM SD	0.123	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.185	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.164	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.242	95% KM Chebyshev UCL	0.321
97.5% KM Chebyshev UCL	0.43	99% KM Chebyshev UCL	0.644

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.367	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.285	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.411	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)	0.482	k star (bias corrected MLE)	0.287
Theta hat (MLE)	0.211	Theta star (bias corrected MLE)	0.353
nu hat (MLE)	3.856	nu star (bias corrected)	2.297
Mean (detects)	0.102		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0041	Mean	0.071
Maximum	0.34	Median	0.01
SD	0.133	CV	1.875
k hat (MLE)	0.491	k star (bias corrected MLE)	0.356
Theta hat (MLE)	0.145	Theta star (bias corrected MLE)	0.199
nu hat (MLE)	5.887	nu star (bias corrected)	4.277
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (4.28, α)	0.834	Adjusted Chi Square Value (4.28, β)	0.418
95% Gamma Approximate UCL (use when n>=50)	0.364	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0687	SD (KM)	0.123
Variance (KM)	0.0151	SE of Mean (KM)	0.0579
k hat (KM)	0.314	k star (KM)	0.268
nu hat (KM)	3.762	nu star (KM)	3.214
theta hat (KM)	0.219	theta star (KM)	0.257
80% gamma percentile (KM)	0.102	90% gamma percentile (KM)	0.205
95% gamma percentile (KM)	0.326	99% gamma percentile (KM)	0.644

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.21, α)	0.439	Adjusted Chi Square Value (3.21, β)	0.199
95% Gamma Approximate KM-UCL (use when n>=50)	0.504	95% Gamma Adjusted KM-UCL (use when n<50)	1.111

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.0681	Mean in Log Scale	-4.81
SD in Original Scale	0.135	SD in Log Scale	2.533
95% t UCL (assumes normality of ROS data)	0.179	95% Percentile Bootstrap UCL	0.172
95% BCA Bootstrap UCL	0.189	95% Bootstrap t UCL	3.475
95% H-UCL (Log ROS)	11525		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.372	KM Geo Mean	0.0126
KM SD (logged)	1.813	95% Critical H Value (KM-Log)	7.014
KM Standard Error of Mean (logged)	0.862	95% H-UCL (KM -Log)	19.23
KM SD (logged)	1.813	95% Critical H Value (KM-Log)	7.014
KM Standard Error of Mean (logged)	0.862		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0687	Mean in Log Scale	-4.443
SD in Original Scale	0.134	SD in Log Scale	2.093
95% t UCL (Assumes normality)	0.179	95% H-Stat UCL	195.1

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

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Suggested UCL to Use

95% KM (t) UCL 0.185

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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-BHC

General Statistics

Total Number of Observations	6	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	3
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	0.011	Minimum Non-Detect	0.002
Maximum Detect	0.054	Maximum Non-Detect	0.002
Variance Detects	5.5300E-4	Percent Non-Detects	50%
Mean Detects	0.027	SD Detects	0.0235
Median Detects	0.016	CV Detects	0.871
Skewness Detects	1.644	Kurtosis Detects	N/A
Mean of Logged Detects	-3.855	SD of Logged Detects	0.832

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.836	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.347	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0145	KM Standard Error of Mean	0.00923
KM SD	0.0185	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0331	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0297	95% KM Bootstrap t UCL	N/A

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

90% KM Chebyshev UCL	0.0422	95% KM Chebyshev UCL	0.0547
97.5% KM Chebyshev UCL	0.0721	99% KM Chebyshev UCL	0.106

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.213	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0122	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	13.28	nu star (bias corrected)	N/A
Mean (detects)	0.027		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0185
Maximum	0.054	Median	0.0105
SD	0.0175	CV	0.948
k hat (MLE)	2.237	k star (bias corrected MLE)	1.229
Theta hat (MLE)	0.00827	Theta star (bias corrected MLE)	0.015
nu hat (MLE)	26.84	nu star (bias corrected)	14.75
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (14.75, α)	7.09	Adjusted Chi Square Value (14.75, β)	5.29
95% Gamma Approximate UCL (use when n>=50)	0.0385	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0145	SD (KM)	0.0185
Variance (KM)	3.4058E-4	SE of Mean (KM)	0.00923
k hat (KM)	0.617	k star (KM)	0.42
nu hat (KM)	7.408	nu star (KM)	5.037
theta hat (KM)	0.0235	theta star (KM)	0.0345
80% gamma percentile (KM)	0.0235	90% gamma percentile (KM)	0.0406
95% gamma percentile (KM)	0.0592	99% gamma percentile (KM)	0.106

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.04, α)	1.169	Adjusted Chi Square Value (5.04, β)	0.63
95% Gamma Approximate KM-UCL (use when n>=50)	0.0625	95% Gamma Adjusted KM-UCL (use when n<50)	0.116

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.299	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Detected Data appear Lognormal at 5% Significance Level

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0143	Mean in Log Scale	-5.247
SD in Original Scale	0.0204	SD in Log Scale	1.693
95% t UCL (assumes normality of ROS data)	0.0311	95% Percentile Bootstrap UCL	0.0282
95% BCA Bootstrap UCL	0.0326	95% Bootstrap t UCL	0.0549
95% H-UCL (Log ROS)	3.212		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.035	KM Geo Mean	0.00651
KM SD (logged)	1.274	95% Critical H Value (KM-Log)	5.074
KM Standard Error of Mean (logged)	0.637	95% H-UCL (KM -Log)	0.264
KM SD (logged)	1.274	95% Critical H Value (KM-Log)	5.074
KM Standard Error of Mean (logged)	0.637		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.014	Mean in Log Scale	-5.381
SD in Original Scale	0.0206	SD in Log Scale	1.753
95% t UCL (Assumes normality)	0.0309	95% H-Stat UCL	4.413

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 0.0331

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.

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

beta-BHC

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.0024	Minimum Non-Detect	0.002
Maximum Detect	0.065	Maximum Non-Detect	0.002
Variance Detects	7.6782E-4	Percent Non-Detects	33.33%
Mean Detects	0.0264	SD Detects	0.0277
Median Detects	0.019	CV Detects	1.052
Skewness Detects	1.265	Kurtosis Detects	1.291
Mean of Logged Detects	-4.222	SD of Logged Detects	1.408

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.0182	KM Standard Error of Mean	0.0107
KM SD	0.0227	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0398	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0358	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0503	95% KM Chebyshev UCL	0.0649
97.5% KM Chebyshev UCL	0.0851	99% KM Chebyshev UCL	0.125

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.191	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.667	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.164	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.403	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)	0.987	k star (bias corrected MLE)	0.413
Theta hat (MLE)	0.0267	Theta star (bias corrected MLE)	0.0637
nu hat (MLE)	7.898	nu star (bias corrected)	3.308
Mean (detects)	0.0264		

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0024	Mean	0.0209
Maximum	0.065	Median	0.0105
SD	0.0231	CV	1.104
k hat (MLE)	1.177	k star (bias corrected MLE)	0.7
Theta hat (MLE)	0.0178	Theta star (bias corrected MLE)	0.0299
nu hat (MLE)	14.12	nu star (bias corrected)	8.394
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (8.39, α)	2.966	Adjusted Chi Square Value (8.39, β)	1.93
95% Gamma Approximate UCL (use when n>=50)	0.0592	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0182	SD (KM)	0.0227
Variance (KM)	5.1567E-4	SE of Mean (KM)	0.0107
k hat (KM)	0.645	k star (KM)	0.433
nu hat (KM)	7.736	nu star (KM)	5.202
theta hat (KM)	0.0283	theta star (KM)	0.0421
80% gamma percentile (KM)	0.0297	90% gamma percentile (KM)	0.0507
95% gamma percentile (KM)	0.0737	99% gamma percentile (KM)	0.131

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.20, α)	1.246	Adjusted Chi Square Value (5.20, β)	0.681
95% Gamma Approximate KM-UCL (use when n>=50)	0.0761	95% Gamma Adjusted KM-UCL (use when n<50)	0.139

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.983	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.169	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.0177	Mean in Log Scale	-5.535
SD in Original Scale	0.0253	SD in Log Scale	2.34
95% t UCL (assumes normality of ROS data)	0.0385	95% Percentile Bootstrap UCL	0.0344
95% BCA Bootstrap UCL	0.0419	95% Bootstrap t UCL	0.0838
95% H-UCL (Log ROS)	717		

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.886	KM Geo Mean	0.00755
KM SD (logged)	1.369	95% Critical H Value (KM-Log)	5.41
KM Standard Error of Mean (logged)	0.645	95% H-UCL (KM -Log)	0.529
KM SD (logged)	1.369	95% Critical H Value (KM-Log)	5.41
KM Standard Error of Mean (logged)	0.645		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0179	Mean in Log Scale	-5.117
SD in Original Scale	0.0251	SD in Log Scale	1.764
95% t UCL (Assumes normality)	0.0386	95% H-Stat UCL	6.271

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 0.0398

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.

Chlordane

General Statistics

Total Number of Observations	6	Number of Distinct Observations	4
Number of Detects	2	Number of Non-Detects	4
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	0.012	Minimum Non-Detect	0.002
Maximum Detect	0.062	Maximum Non-Detect	0.054
Variance Detects	0.00125	Percent Non-Detects	66.67%
Mean Detects	0.037	SD Detects	0.0354
Median Detects	0.037	CV Detects	0.956
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-3.602	SD of Logged Detects	1.161

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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).

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

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

KM Mean	0.0141	KM Standard Error of Mean	0.0126
KM SD	0.0218	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0395	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0349	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.052	95% KM Chebyshev UCL	0.0691
97.5% KM Chebyshev UCL	0.093	99% KM Chebyshev UCL	0.14

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.788	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0207	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.154	nu star (bias corrected)	N/A
Mean (detects)	0.037		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0141	SD (KM)	0.0218
Variance (KM)	4.7483E-4	SE of Mean (KM)	0.0126
k hat (KM)	0.418	k star (KM)	0.32
nu hat (KM)	5.013	nu star (KM)	3.84
theta hat (KM)	0.0337	theta star (KM)	0.044
80% gamma percentile (KM)	0.0219	90% gamma percentile (KM)	0.0412
95% gamma percentile (KM)	0.0631	99% gamma percentile (KM)	0.12

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0122
Approximate Chi Square Value (3.84, α)	0.659	Adjusted Chi Square Value (3.84, β)	0.316
95% Gamma Approximate KM-UCL (use when n>=50)	0.082	95% Gamma Adjusted KM-UCL (use when n<50)	0.171

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	0.0134	Mean in Log Scale	-5.647
SD in Original Scale	0.0242	SD in Log Scale	1.8
95% t UCL (assumes normality of ROS data)	0.0333	95% Percentile Bootstrap UCL	0.0316
95% BCA Bootstrap UCL	0.0352	95% Bootstrap t UCL	0.307
95% H-UCL (Log ROS)	4.876		

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.269	KM Geo Mean	0.00515
KM SD (logged)	1.319	95% Critical H Value (KM-Log)	5.233
KM Standard Error of Mean (logged)	0.789	95% H-UCL (KM -Log)	0.269
KM SD (logged)	1.319	95% Critical H Value (KM-Log)	5.233
KM Standard Error of Mean (logged)	0.789		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0173	Mean in Log Scale	-5.256
SD in Original Scale	0.0242	SD in Log Scale	1.882
95% t UCL (Assumes normality)	0.0372	95% H-Stat UCL	13.9

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 (Chebyshev) UCL 0.0691

Warning: Recommended UCL exceeds the maximum observation

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.

delta-BHC

General Statistics

Total Number of Observations	6	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	3
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	0.0076	Minimum Non-Detect	0.002
Maximum Detect	0.029	Maximum Non-Detect	0.002
Variance Detects	1.1905E-4	Percent Non-Detects	50%
Mean Detects	0.0195	SD Detects	0.0109
Median Detects	0.022	CV Detects	0.559
Skewness Detects	-0.965	Kurtosis Detects	N/A
Mean of Logged Detects	-4.079	SD of Logged Detects	0.707

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.256	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0108	KM Standard Error of Mean	0.0054
KM SD	0.0108	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0216	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0196	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.027	95% KM Chebyshev UCL	0.0343
97.5% KM Chebyshev UCL	0.0445	99% KM Chebyshev UCL	0.0645

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3.648	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00536	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	21.89	nu star (bias corrected)	N/A
Mean (detects)	0.0195		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0076	Mean	0.0148
Maximum	0.029	Median	0.01
SD	0.00865	CV	0.586
k hat (MLE)	4.107	k star (bias corrected MLE)	2.164
Theta hat (MLE)	0.0036	Theta star (bias corrected MLE)	0.00682
nu hat (MLE)	49.28	nu star (bias corrected)	25.97
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (25.97, α)	15.36	Adjusted Chi Square Value (25.97, β)	12.51
95% Gamma Approximate UCL (use when n>=50)	0.025	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0108	SD (KM)	0.0108
Variance (KM)	1.1654E-4	SE of Mean (KM)	0.0054
k hat (KM)	0.995	k star (KM)	0.608
nu hat (KM)	11.94	nu star (KM)	7.302
theta hat (KM)	0.0108	theta star (KM)	0.0177
80% gamma percentile (KM)	0.0177	90% gamma percentile (KM)	0.0279
95% gamma percentile (KM)	0.0385	99% gamma percentile (KM)	0.0642

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.30, α)	2.338	Adjusted Chi Square Value (7.30, β)	1.455
95% Gamma Approximate KM-UCL (use when n>=50)	0.0336	95% Gamma Adjusted KM-UCL (use when n<50)	0.054

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.311	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.0108	Mean in Log Scale	-5.189
SD in Original Scale	0.0118	SD in Log Scale	1.359
95% t UCL (assumes normality of ROS data)	0.0205	95% Percentile Bootstrap UCL	0.0186
95% BCA Bootstrap UCL	0.0188	95% Bootstrap t UCL	0.0401
95% H-UCL (Log ROS)	0.368		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.147	KM Geo Mean	0.00582
KM SD (logged)	1.143	95% Critical H Value (KM-Log)	4.627
KM Standard Error of Mean (logged)	0.572	95% H-UCL (KM -Log)	0.119
KM SD (logged)	1.143	95% Critical H Value (KM-Log)	4.627
KM Standard Error of Mean (logged)	0.572		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0103	Mean in Log Scale	-5.493
SD in Original Scale	0.0123	SD in Log Scale	1.613
95% t UCL (Assumes normality)	0.0204	95% H-Stat UCL	1.406

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

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Suggested UCL to Use

95% KM (t) UCL 0.0216

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.

Dieldrin

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.0032	Minimum Non-Detect	0.002
Maximum Detect	0.088	Maximum Non-Detect	0.002
Variance Detects	0.00159	Percent Non-Detects	33.33%
Mean Detects	0.0286	SD Detects	0.0398
Median Detects	0.0115	CV Detects	1.395
Skewness Detects	1.94	Kurtosis Detects	3.819
Mean of Logged Detects	-4.277	SD of Logged Detects	1.371

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.718	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.411	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.0197	KM Standard Error of Mean	0.0145
KM SD	0.0308	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.049	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0436	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0633	95% KM Chebyshev UCL	0.083
97.5% KM Chebyshev UCL	0.11	99% KM Chebyshev UCL	0.164

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.463	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.669	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.367	**Kolmogorov-Smirnov GOF**	

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

5% K-S Critical Value	0.404	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)	0.821	k star (bias corrected MLE)	0.372
Theta hat (MLE)	0.0348	Theta star (bias corrected MLE)	0.0768
nu hat (MLE)	6.565	nu star (bias corrected)	2.975
Mean (detects)	0.0286		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0032	Mean	0.0224
Maximum	0.088	Median	0.0105
SD	0.0323	CV	1.444
k hat (MLE)	0.986	k star (bias corrected MLE)	0.604
Theta hat (MLE)	0.0227	Theta star (bias corrected MLE)	0.037
nu hat (MLE)	11.84	nu star (bias corrected)	7.251
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (7.25, α)	2.31	Adjusted Chi Square Value (7.25, β)	1.434
95% Gamma Approximate UCL (use when n>=50)	0.0702	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0197	SD (KM)	0.0308
Variance (KM)	9.4978E-4	SE of Mean (KM)	0.0145
k hat (KM)	0.409	k star (KM)	0.315
nu hat (KM)	4.903	nu star (KM)	3.785
theta hat (KM)	0.0482	theta star (KM)	0.0625
80% gamma percentile (KM)	0.0306	90% gamma percentile (KM)	0.0577
95% gamma percentile (KM)	0.0887	99% gamma percentile (KM)	0.169

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.78, α)	0.639	Adjusted Chi Square Value (3.78, β)	0.304
95% Gamma Approximate KM-UCL (use when n>=50)	0.117	95% Gamma Adjusted KM-UCL (use when n<50)	0.245

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.292	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0192	Mean in Log Scale	-5.535
SD in Original Scale	0.0341	SD in Log Scale	2.251
95% t UCL (assumes normality of ROS data)	0.0472	95% Percentile Bootstrap UCL	0.0452
95% BCA Bootstrap UCL	0.0497	95% Bootstrap t UCL	0.142
95% H-UCL (Log ROS)	292.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.923	KM Geo Mean	0.00728
KM SD (logged)	1.332	95% Critical H Value (KM-Log)	5.279
KM Standard Error of Mean (logged)	0.628	95% H-UCL (KM -Log)	0.41
KM SD (logged)	1.332	95% Critical H Value (KM-Log)	5.279
KM Standard Error of Mean (logged)	0.628		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0194	Mean in Log Scale	-5.154
SD in Original Scale	0.034	SD in Log Scale	1.724
95% t UCL (Assumes normality)	0.0473	95% H-Stat UCL	4.454

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 Bootstrap t UCL	N/A	ıa Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.245

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.

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

gamma-BHC (Lindane)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	3
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	0.0067	Minimum Non-Detect	0.002
Maximum Detect	0.03	Maximum Non-Detect	0.002
Variance Detects	1.6806E-4	Percent Non-Detects	50%
Mean Detects	0.0151	SD Detects	0.013
Median Detects	0.0085	CV Detects	0.86
Skewness Detects	1.695	Kurtosis Detects	N/A
Mean of Logged Detects	-4.427	SD of Logged Detects	0.806

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.00853	KM Standard Error of Mean	0.00497
KM SD	0.00994	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0185	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0167	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0234	95% KM Chebyshev UCL	0.0302
97.5% KM Chebyshev UCL	0.0396	99% KM Chebyshev UCL	0.058

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.314	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00651	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	13.88	nu star (bias corrected)	N/A

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Mean (detects)	0.0151

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0067	Mean	0.0125
Maximum	0.03	Median	0.01
SD	0.00866	CV	0.691
k hat (MLE)	3.821	k star (bias corrected MLE)	2.021
Theta hat (MLE)	0.00328	Theta star (bias corrected MLE)	0.0062
nu hat (MLE)	45.85	nu star (bias corrected)	24.26
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (24.26, α)	14.04	Adjusted Chi Square Value (24.26, β)	11.34
95% Gamma Approximate UCL (use when n>=50)	0.0216	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00853	SD (KM)	0.00994
Variance (KM)	9.8706E-5	SE of Mean (KM)	0.00497
k hat (KM)	0.738	k star (KM)	0.48
nu hat (KM)	8.853	nu star (KM)	5.76
theta hat (KM)	0.0116	theta star (KM)	0.0178
80% gamma percentile (KM)	0.014	90% gamma percentile (KM)	0.0233
95% gamma percentile (KM)	0.0333	99% gamma percentile (KM)	0.0579

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.76, α)	1.518	Adjusted Chi Square Value (5.76, β)	0.866
95% Gamma Approximate KM-UCL (use when n>=50)	0.0324	95% Gamma Adjusted KM-UCL (use when n<50)	0.0568

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.331	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.00804	Mean in Log Scale	-5.748
SD in Original Scale	0.0113	SD in Log Scale	1.61
95% t UCL (assumes normality of ROS data)	0.0173	95% Percentile Bootstrap UCL	0.0157
95% BCA Bootstrap UCL	0.0181	95% Bootstrap t UCL	0.0294
95% H-UCL (Log ROS)	1.069		

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.321	KM Geo Mean	0.00489
KM SD (logged)	1.008	95% Critical H Value (KM-Log)	4.154
KM Standard Error of Mean (logged)	0.504	95% H-UCL (KM -Log)	0.0528
KM SD (logged)	1.008	95% Critical H Value (KM-Log)	4.154
KM Standard Error of Mean (logged)	0.504		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.00803	Mean in Log Scale	-5.667
SD in Original Scale	0.0113	SD in Log Scale	1.451
95% t UCL (Assumes normality)	0.0173	95% H-Stat UCL	0.402

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 0.0185

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.

Heptachlor

General Statistics

Total Number of Observations	6	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	5
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

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 Heptachlor was not processed!

Methoxychlor

General Statistics

Total Number of Observations	6	Number of Distinct Observations	3
Number of Detects	0	Number of Non-Detects	6
Number of Distinct Detects	0	Number of Distinct Non-Detects	3

Attachment A-2c
ProUCL Output for Sitewide Pesticides in Sediment

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor was not processed!

ATTACHMENT A-3

ProUCL Calculations - Site-wide Surface Water

A-3a ProUCL Data Set for Site-wide Surface Water

A-3b ProUCL Output for Site-wide Surface Water Metals (Dissolved)

A-3c ProUCL Output for Site-wide Surface Water Pesticides

A-3d ProUCL Data Set for Site-wide Surface Water - Metals (Total)

A-3e ProUCL Output for Site-wide Surface Water - Metals (Total)

Attachment A-3a
ProUCL Data Set for Sitewide Surface Water

Row Labels	UOM	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	alpha-BHC	D_alpha-BHC	alpha-Chlordane	D_alpha-Chlordane	Arsenic	D_Arsenic	beta-BHC	D_beta-BHC	Copper	D_Copper	delta-BHC	D_delta-BHC
SW-2010-10-05	µg/L	0.1	0	0.1	0	0.1	0	0.23	1	0.05	0	5	0	0.12	1	6.77	1	0.11	1
SW-2010-10-06	µg/L	1	0	1	0	1	0	0.22	1	0.05	0	5	0	0.12	1	4.71	1	0.12	1
SW-2010-10-11	µg/L	0.1	0	0.1	0	0.1	0	0.23	1	0.05	0	5	0	0.099	1	6.59	1	0.11	1
SW-2010-10-11	µg/L	0.1	0	0.1	0	0.1	0	0.05	1	0.05	0	5.34	1	0.05	0	8.54	1	0.05	0
SW-2010-11-05	µg/L	0.1	0	0.1	0	0.1	0	0.18	1	0.05	0	5	0	0.099	1	6.31	1	0.091	1
SW-2010-11-06	µg/L	1	0	1	0	1	0	0.25	1	0.05	0	5	0	0.43	1	52.7	1	0.15	1
SW-2010-11-11	µg/L	0.1	0	0.1	0	0.1	0	0.35	1	0.05	0	5	0	1.1	1	256	1	0.16	1
SW-2010-11-11	µg/L	0.1	0	0.1	0	0.1	0	0.05	0	0.05	0	5.39	1	0.057	1	21.6	1	0.05	0
SW-2010-14-05	µg/L	0.1	0	0.1	0	0.1	0	0.38	1	0.05	0	5	0	0.52	1	17.7	1	0.26	1
SW-2010-14-06	µg/L	1	0	1	0	1	0	0.31	1	0.05	0	5	0	0.53	1	19.7	1	0.22	1
SW-2010-14-11	µg/L	0.1	0	0.1	0	0.1	0	0.41	1	0.05	0	5	0	0.57	1	48.4	1	0.3	1
SW-2010-14-11	µg/L	0.1	0	0.1	0	0.1	0	0.12	1	0.05	0	5	0	0.29	1	33.2	1	0.12	1
SW-2010-15-05	µg/L	0.1	0	0.1	0	0.1	0	0.32	1	0.05	0	5	0	0.47	1	15.6	1	0.22	1
SW-2010-15-06	µg/L	1	0	1	0	1	0	0.3	1	0.05	0	5	0	0.49	1	22.2	1	0.2	1
SW-2010-15-11	µg/L	0.1	0	0.1	0	0.1	0	0.37	1	0.05	0	5	0	0.51	1	27.6	1	0.25	1
SW-2010-15-11	µg/L	0.1	0	0.1	0	0.1	0	0.1	1	0.05	0	5	0	0.27	1	28.9	1	0.088	1
SW-2010-17-05	µg/L	0.1	0	0.1	0	0.1	0	0.31	1	0.05	0	5	0	0.44	1	11.5	1	0.2	1
SW-2010-17-06	µg/L	1	0	1	0	1	0	0.29	1	0.05	0	5	0	0.52	1	11.6	1	0.21	1
SW-2010-17-11	µg/L	0.1	0	0.1	0	0.1	0	0.47	1	0.05	0	5	0	0.47	1	16.5	1	0.27	1
SW-2010-17-11	µg/L	0.1	0	0.1	0	0.1	0	0.081	1	0.05	0	5	0	0.2	1	22.5	1	0.068	1
SW-2010-5-051	µg/L	0.1	0	0.1	0	0.1	0	0.087	1	0.05	0	5	0	0.078	1	8.4	1	0.05	0
SW-2010-5-061	µg/L	1	0	1	0	1	0	0.074	1	0.05	0	5	0	0.085	1	5.36	1	0.05	0
SW-2010-5-111	µg/L	0.1	0	0.1	0	0.1	0	0.2	1	0.05	0	5	0	0.083	1	7.06	1	0.05	0
SW-2010-5-111	µg/L	0.1	0	0.1	0	0.1	0	0.05	0	0.05	0	6.11	1	0.05	0	8.88	1	0.05	0
SW-2014-20-05	µg/L	0.1	0	0.1	0	0.1	0	0.37	1	0.05	0	5	0	1.8	1	250	1	0.18	1
SW-2014-20-06	µg/L	1	0	1	0	1	0	0.44	1	0.05	0	5	0	3.4	1	509	1	0.29	1
SW-2014-20-11	µg/L	0.1	0	0.1	0	0.1	0	0.54	1	0.05	0	5	0	3	1	641	1	0.28	1
SW-2014-20-11	µg/L	0.1	0	0.1	0	0.1	0	0.24	1	0.05	0	5	0	1.6	1	195	1	0.2	1
SW-2014-21-05	µg/L	0.1	0	0.1	0	0.1	0	0.29	1	0.05	0	5	0	3.4	1	756	1	0.24	1
SW-2014-21-06	µg/L	1	0	1	0	1	0	0.31	1	0.05	0	5	0	3.8	1	682	1	0.29	1
SW-2014-21-11	µg/L	0.1	0	0.1	0	0.1	0	0.38	1	0.05	0	5	0	3.9	1	901	1	0.27	1
SW-2014-21-11	µg/L	0.1	0	0.1	0	0.1	0	0.15	1	0.05	0	5	0	1.2	1	122	1	0.17	1
SW-2010-10-05	µg/L	0.1	0	0.1	0	0.1	0	0.12	1	0.05	0	5	0	0.05	0	9.83	1	0.16	1
SW-2010-11-05	µg/L	0.1	0	0.1	0	0.1	0	0.12	1	0.05	0	5	0	0.05	0	12.7	1	0.05	0
SW-2010-14-05	µg/L	0.1	0	0.1	0	0.1	0	0.26	1	0.05	0	5	0	0.36	1	24.2	1	0.16	1
SW-2010-15-05	µg/L	0.1	0	0.1	0	0.1	0	0.2	1	0.05	0	5	0	0.3	1	23	1	0.21	1
SW-2010-17-05	µg/L	0.1	0	0.1	0	0.1	0	0.2	1	0.05	0	5	0	0.3	1	25.1	1	0.21	1
SW-2010-5-051	µg/L	0.1	0	0.1	0	0.1	0	0.052	1	0.05	0	5	0	0.05	0	9.66	1	0.05	0
SW-2014-20-05	µg/L	0.1	0	0.1	0	0.1	0	0.18	1	0.05	0	5	0	1.1	1	119	1	0.1	1
SW-2014-21-05	µg/L	0.1	0	0.1	0	0.1	0	0.14	1	0.05	0	5	0	1.2	1	140	1	0.1	1

Attachment A-3a
ProUCL Data Set for Sitewide Surface Water

Row Labels	UOM	Dieldrin	D_Dieldrin	gamma-BHC (Lindane)	D_gamma-BHC (Lindane)	gamma-Chlordane	D_gamma-Chlordane	Heptachlor	D_Heptachlor	Lead	D_Lead	Methoxychlor	D_Methoxychlor	Toxaphene	D_Toxaphene	Zinc	D_Zinc
SW-2010-10-05	µg/L	0.1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	477	1
SW-2010-10-06	µg/L	1	0	0.1	1	0.05	0	0.05	0	1	0	0.5	0	3	0	407	1
SW-2010-10-11	µg/L	0.1	0	0.075	1	0.05	0	0.05	0	1	0	0.5	0	3	0	557	1
SW-2010-10-11	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	146	1
SW-2010-11-05	µg/L	0.1	0	0.085	1	0.05	0	0.05	0	1	0	0.5	0	3	0	472	1
SW-2010-11-06	µg/L	1	0	0.12	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1600	1
SW-2010-11-11	µg/L	0.1	0	0.15	1	0.05	0	0.05	0	1	0	0.5	0	3	0	5920	1
SW-2010-11-11	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	413	1
SW-2010-14-05	µg/L	0.1	0	0.13	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1180	1
SW-2010-14-06	µg/L	1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1270	1
SW-2010-14-11	µg/L	0.1	0	0.1	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1380	1
SW-2010-14-11	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	789	1
SW-2010-15-05	µg/L	0.1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1040	1
SW-2010-15-06	µg/L	1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1290	1
SW-2010-15-11	µg/L	0.1	0	0.087	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1430	1
SW-2010-15-11	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	638	1
SW-2010-17-05	µg/L	0.1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	868	1
SW-2010-17-06	µg/L	1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	890	1
SW-2010-17-11	µg/L	0.1	0	0.12	1	0.05	0	0.05	0	1	0	0.5	0	3	0	1200	1
SW-2010-17-11	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	461	1
SW-2010-5-051	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	578	1
SW-2010-5-061	µg/L	1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	504	1
SW-2010-5-111	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	789	1
SW-2014-20-05	µg/L	0.1	0	0.21	1	0.05	0	0.05	0	1	0	0.5	0	3	0	189	1
SW-2014-20-06	µg/L	1	0	0.22	1	0.05	0	0.05	0	1	0	0.5	0	3	0	4500	1
SW-2014-20-11	µg/L	0.1	0	0.25	1	0.05	0	0.05	0	1	0	0.5	0	3	0	7700	1
SW-2014-20-11	µg/L	0.1	0	0.13	1	0.05	0	0.05	0	1	0	0.5	0	3	0	11800	1
SW-2014-21-05	µg/L	0.1	0	0.22	1	0.05	0	0.05	0	1	0	0.5	0	3	0	5240	1
SW-2014-21-06	µg/L	1	0	0.18	1	0.05	0	0.05	0	1	0	0.5	0	3	0	9670	1
SW-2014-21-11	µg/L	0.1	0	0.18	1	0.05	0	0.05	0	1	0	0.5	0	3	0	8450	1
SW-2014-21-11	µg/L	0.1	0	0.07	1	0.05	0	0.05	0	1	0	0.5	0	3	0	12400	1
SW-2010-10-05	µg/L	0.1	0	0.074	1	0.05	0	0.05	0	1	0	0.5	0	3	0	2640	1
SW-2010-11-05	µg/L	0.1	0	0.07	1	0.05	0	0.05	0	1	0	0.5	0	3	0	190	1
SW-2010-14-05	µg/L	0.1	0	0.1	1	0.05	0	0.05	0	1	0	0.5	0	3	0	182	1
SW-2010-15-05	µg/L	0.1	0	0.084	1	0.05	0	0.05	0	1	0	0.5	0	3	0	721	1
SW-2010-17-05	µg/L	0.1	0	0.091	1	0.05	0	0.05	0	1	0	0.5	0	3	0	641	1
SW-2010-5-051	µg/L	0.1	0	0.05	0	0.05	0	0.05	0	1	0	0.5	0	3	0	587	1
SW-2014-20-05	µg/L	0.1	0	0.11	1	0.05	0	0.05	0	1	0	0.5	0	3	0	307	1
SW-2014-21-05	µg/L	0.1	0	0.091	1	0.05	0	0.05	0	1	0	0.5	0	3	0	3200	1
																3410	1

Attachment A-3b
ProUCL Output for Sitewide Metals in Surface Water

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/19/2018 12:00:17 PM
From File	2018_06_19 Eco SW ('16-'18) ProUCL input - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Copper

General Statistics

Total Number of Observations	40	Number of Distinct Observations	40
		Number of Missing Observations	0
Minimum	4.71	Mean	127.2
Maximum	901	Median	22.35
SD	232	Std. Error of Mean	36.68
Coefficient of Variation	1.824	Skewness	2.246

Normal GOF Test

Shapiro Wilk Test Statistic	0.578	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.139	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	189	95% Adjusted-CLT UCL (Chen-1995)	201.5
		95% Modified-t UCL (Johnson-1978)	191.2

Gamma GOF Test

A-D Test Statistic	3.481	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.817	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.277	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.148	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.484	k star (bias corrected MLE)	0.464
Theta hat (MLE)	262.9	Theta star (bias corrected MLE)	274
nu hat (MLE)	38.71	nu star (bias corrected)	37.14
MLE Mean (bias corrected)	127.2	MLE Sd (bias corrected)	186.7
		Approximate Chi Square Value (0.05)	24.19
Adjusted Level of Significance	0.044	Adjusted Chi Square Value	23.79

Attachment A-3b
ProUCL Output for Sitewide Metals in Surface Water

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	195.3	95% Adjusted Gamma UCL (use when n<50)	198.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.877	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.139	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.55	Mean of logged Data	3.526
Maximum of Logged Data	6.804	SD of logged Data	1.559

Assuming Lognormal Distribution

95% H-UCL	250.4	90% Chebyshev (MVUE) UCL	212.5
95% Chebyshev (MVUE) UCL	259.9	97.5% Chebyshev (MVUE) UCL	325.8
99% Chebyshev (MVUE) UCL	455.3		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	187.5	95% Jackknife UCL	189
95% Standard Bootstrap UCL	188.4	95% Bootstrap-t UCL	213.9
95% Hall's Bootstrap UCL	189.3	95% Percentile Bootstrap UCL	192
95% BCA Bootstrap UCL	208.2		
90% Chebyshev(Mean, Sd) UCL	237.2	95% Chebyshev(Mean, Sd) UCL	287.1
97.5% Chebyshev(Mean, Sd) UCL	356.3	99% Chebyshev(Mean, Sd) UCL	492.2

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	287.1

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.

Zinc

General Statistics

Total Number of Observations	40	Number of Distinct Observations	39
		Number of Missing Observations	0
Minimum	146	Mean	2403

Attachment A-3b
ProUCL Output for Sitewide Metals in Surface Water

Maximum	12400	Median	879
SD	3274	Std. Error of Mean	517.7
Coefficient of Variation	1.362	Skewness	1.923

Normal GOF Test

Shapiro Wilk Test Statistic	0.675	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.322	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.139	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	3275	95% Adjusted-CLT UCL (Chen-1995)	3423
		95% Modified-t UCL (Johnson-1978)	3302

Gamma GOF Test

A-D Test Statistic	1.984	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.787	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.215	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.145	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.797	k star (bias corrected MLE)	0.754
Theta hat (MLE)	3015	Theta star (bias corrected MLE)	3188
nu hat (MLE)	63.76	nu star (bias corrected)	60.31
MLE Mean (bias corrected)	2403	MLE Sd (bias corrected)	2768
		Approximate Chi Square Value (0.05)	43.45
Adjusted Level of Significance	0.044	Adjusted Chi Square Value	42.92

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3336	95% Adjusted Gamma UCL (use when n<50)	3377

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.126	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.139	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.984	Mean of logged Data	7.04
Maximum of Logged Data	9.425	SD of logged Data	1.21

Attachment A-3b
ProUCL Output for Sitewide Metals in Surface Water

Assuming Lognormal Distribution

95% H-UCL	3974	90% Chebyshev (MVUE) UCL	3917
95% Chebyshev (MVUE) UCL	4649	97.5% Chebyshev (MVUE) UCL	5665
99% Chebyshev (MVUE) UCL	7660		

Attachment A-3b
ProUCL Output for Sitewide Metals in Surface Water

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3255	95% Jackknife UCL	3275
95% Standard Bootstrap UCL	3226	95% Bootstrap-t UCL	3527
95% Hall's Bootstrap UCL	3321	95% Percentile Bootstrap UCL	3286
95% BCA Bootstrap UCL	3455		
90% Chebyshev(Mean, Sd) UCL	3956	95% Chebyshev(Mean, Sd) UCL	4660
97.5% Chebyshev(Mean, Sd) UCL	5636	99% Chebyshev(Mean, Sd) UCL	7554

Suggested UCL to Use

95% H-UCL 3974

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/19/2018 12:00:40 PM
From File	2018_06_19 Eco SW ('16-'18) ProUCL input - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDT

General Statistics

Total Number of Observations	40	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	40
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDT was not processed!

alpha-BHC

General Statistics

Total Number of Observations	40	Number of Distinct Observations	27
Number of Detects	38	Number of Non-Detects	2
Number of Distinct Detects	27	Number of Distinct Non-Detects	1
Minimum Detect	0.05	Minimum Non-Detect	0.05
Maximum Detect	0.54	Maximum Non-Detect	0.05
Variance Detects	0.0153	Percent Non-Detects	5%
Mean Detects	0.245	SD Detects	0.124
Median Detects	0.235	CV Detects	0.505
Skewness Detects	0.304	Kurtosis Detects	-0.536
Mean of Logged Detects	-1.561	SD of Logged Detects	0.611

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.938	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0812	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.142	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.236	KM Standard Error of Mean	0.0203
KM SD	0.126	95% KM (BCA) UCL	0.267
95% KM (t) UCL	0.27	95% KM (Percentile Bootstrap) UCL	0.27
95% KM (z) UCL	0.269	95% KM Bootstrap t UCL	0.271
90% KM Chebyshev UCL	0.296	95% KM Chebyshev UCL	0.324
97.5% KM Chebyshev UCL	0.362	99% KM Chebyshev UCL	0.437

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.43	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.111	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.144	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)	3.373	k star (bias corrected MLE)	3.124
Theta hat (MLE)	0.0728	Theta star (bias corrected MLE)	0.0785
nu hat (MLE)	256.3	nu star (bias corrected)	237.4
Mean (detects)	0.245		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0364	Mean	0.235
Maximum	0.54	Median	0.23
SD	0.129	CV	0.546
k hat (MLE)	2.748	k star (bias corrected MLE)	2.559
Theta hat (MLE)	0.0856	Theta star (bias corrected MLE)	0.0919
nu hat (MLE)	219.9	nu star (bias corrected)	204.7
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (204.70, α)	172.6	Adjusted Chi Square Value (204.70, β)	171.5
95% Gamma Approximate UCL (use when n>=50)	0.279	95% Gamma Adjusted UCL (use when n<50)	0.281

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.236	SD (KM)	0.126
Variance (KM)	0.016	SE of Mean (KM)	0.0203
k hat (KM)	3.471	k star (KM)	3.227
nu hat (KM)	277.7	nu star (KM)	258.2
theta hat (KM)	0.0679	theta star (KM)	0.073
80% gamma percentile (KM)	0.333	90% gamma percentile (KM)	0.411
95% gamma percentile (KM)	0.484	99% gamma percentile (KM)	0.642

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (258.17, α)	222	Adjusted Chi Square Value (258.17, β)	220.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.274	95% Gamma Adjusted KM-UCL (use when n<50)	0.276

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.126	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.142	Detected Data appear 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	0.236	Mean in Log Scale	-1.632
SD in Original Scale	0.128	SD in Log Scale	0.674
95% t UCL (assumes normality of ROS data)	0.27	95% Percentile Bootstrap UCL	0.269
95% BCA Bootstrap UCL	0.27	95% Bootstrap t UCL	0.272
95% H-UCL (Log ROS)	0.307		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.632	KM Geo Mean	0.195
KM SD (logged)	0.666	95% Critical H Value (KM-Log)	2.06
KM Standard Error of Mean (logged)	0.107	95% H-UCL (KM -Log)	0.304
KM SD (logged)	0.666	95% Critical H Value (KM-Log)	2.06
KM Standard Error of Mean (logged)	0.107		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.234	Mean in Log Scale	-1.667
SD in Original Scale	0.13	SD in Log Scale	0.758
95% t UCL (Assumes normality)	0.269	95% H-Stat UCL	0.327

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	0.27

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.

beta-BHC

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

General Statistics

Total Number of Observations	40	Number of Distinct Observations	28
Number of Detects	35	Number of Non-Detects	5
Number of Distinct Detects	27	Number of Distinct Non-Detects	1
Minimum Detect	0.057	Minimum Non-Detect	0.05
Maximum Detect	3.9	Maximum Non-Detect	0.05
Variance Detects	1.323	Percent Non-Detects	12.5%
Mean Detects	0.94	SD Detects	1.15
Median Detects	0.47	CV Detects	1.223
Skewness Detects	1.667	Kurtosis Detects	1.556
Mean of Logged Detects	-0.744	SD of Logged Detects	1.22

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.71	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.934	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.148	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

KM Mean	0.829	KM Standard Error of Mean	0.177
KM SD	1.1	95% KM (BCA) UCL	1.12
95% KM (t) UCL	1.126	95% KM (Percentile Bootstrap) UCL	1.13
95% KM (z) UCL	1.119	95% KM Bootstrap t UCL	1.202
90% KM Chebyshev UCL	1.359	95% KM Chebyshev UCL	1.599
97.5% KM Chebyshev UCL	1.931	99% KM Chebyshev UCL	2.585

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.133	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.782	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.207	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.154	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)	0.862	k star (bias corrected MLE)	0.807
Theta hat (MLE)	1.091	Theta star (bias corrected MLE)	1.166
nu hat (MLE)	60.31	nu star (bias corrected)	56.47
Mean (detects)	0.94		

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.824
Maximum	3.9	Median	0.435
SD	1.118	CV	1.357
k hat (MLE)	0.598	k star (bias corrected MLE)	0.57
Theta hat (MLE)	1.377	Theta star (bias corrected MLE)	1.445
nu hat (MLE)	47.87	nu star (bias corrected)	45.62
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (45.62, α)	31.12	Adjusted Chi Square Value (45.62, β)	30.67
95% Gamma Approximate UCL (use when n>=50)	1.208	95% Gamma Adjusted UCL (use when n<50)	1.226

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.829	SD (KM)	1.1
Variance (KM)	1.211	SE of Mean (KM)	0.177
k hat (KM)	0.568	k star (KM)	0.542
nu hat (KM)	45.41	nu star (KM)	43.33
theta hat (KM)	1.461	theta star (KM)	1.53
80% gamma percentile (KM)	1.365	90% gamma percentile (KM)	2.205
95% gamma percentile (KM)	3.095	99% gamma percentile (KM)	5.266

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (43.33, α)	29.24	Adjusted Chi Square Value (43.33, β)	28.8
95% Gamma Approximate KM-UCL (use when n>=50)	1.229	95% Gamma Adjusted KM-UCL (use when n<50)	1.247

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.934	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.127	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.148	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	0.827	Mean in Log Scale	-1.094
SD in Original Scale	1.116	SD in Log Scale	1.484
95% t UCL (assumes normality of ROS data)	1.124	95% Percentile Bootstrap UCL	1.139
95% BCA Bootstrap UCL	1.177	95% Bootstrap t UCL	1.21
95% H-UCL (Log ROS)	2.069		

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.025	KM Geo Mean	0.359
KM SD (logged)	1.349	95% Critical H Value (KM-Log)	2.844
KM Standard Error of Mean (logged)	0.216	95% H-UCL (KM -Log)	1.648
KM SD (logged)	1.349	95% Critical H Value (KM-Log)	2.844
KM Standard Error of Mean (logged)	0.216		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.826	Mean in Log Scale	-1.112
SD in Original Scale	1.117	SD in Log Scale	1.507
95% t UCL (Assumes normality)	1.123	95% H-Stat UCL	2.143

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

KM H-UCL 1.648

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.

delta-BHC

General Statistics

Total Number of Observations	40	Number of Distinct Observations	21
Number of Detects	32	Number of Non-Detects	8
Number of Distinct Detects	20	Number of Distinct Non-Detects	1
Minimum Detect	0.068	Minimum Non-Detect	0.05
Maximum Detect	0.3	Maximum Non-Detect	0.05
Variance Detects	0.0047	Percent Non-Detects	20%
Mean Detects	0.188	SD Detects	0.0686
Median Detects	0.2	CV Detects	0.365
Skewness Detects	-0.0343	Kurtosis Detects	-1.148
Mean of Logged Detects	-1.748	SD of Logged Detects	0.411

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.946	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.93	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.12	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.154	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.16	KM Standard Error of Mean	0.0131
KM SD	0.0817	95% KM (BCA) UCL	0.18
95% KM (t) UCL	0.182	95% KM (Percentile Bootstrap) UCL	0.181
95% KM (z) UCL	0.182	95% KM Bootstrap t UCL	0.184
90% KM Chebyshev UCL	0.2	95% KM Chebyshev UCL	0.217
97.5% KM Chebyshev UCL	0.242	99% KM Chebyshev UCL	0.291

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.62	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.147	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.156	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)	6.835	k star (bias corrected MLE)	6.215
Theta hat (MLE)	0.0275	Theta star (bias corrected MLE)	0.0302
nu hat (MLE)	437.4	nu star (bias corrected)	397.8
Mean (detects)	0.188		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0314	Mean	0.163
Maximum	0.3	Median	0.16
SD	0.0794	CV	0.487
k hat (MLE)	3.665	k star (bias corrected MLE)	3.407
Theta hat (MLE)	0.0445	Theta star (bias corrected MLE)	0.0479
nu hat (MLE)	293.2	nu star (bias corrected)	272.6
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (272.56, α)	235.3	Adjusted Chi Square Value (272.56, β)	234
95% Gamma Approximate UCL (use when n>=50)	0.189	95% Gamma Adjusted UCL (use when n<50)	0.19

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.16	SD (KM)	0.0817
Variance (KM)	0.00668	SE of Mean (KM)	0.0131
k hat (KM)	3.841	k star (KM)	3.569
nu hat (KM)	307.2	nu star (KM)	285.5
theta hat (KM)	0.0417	theta star (KM)	0.0449
80% gamma percentile (KM)	0.224	90% gamma percentile (KM)	0.274
95% gamma percentile (KM)	0.32	99% gamma percentile (KM)	0.42

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (285.54, α)	247.4	Adjusted Chi Square Value (285.54, β)	246.1
95% Gamma Approximate KM-UCL (use when n>=50)	0.185	95% Gamma Adjusted KM-UCL (use when n<50)	0.186

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.163	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.154	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	0.164	Mean in Log Scale	-1.93
SD in Original Scale	0.0774	SD in Log Scale	0.526
95% t UCL (assumes normality of ROS data)	0.185	95% Percentile Bootstrap UCL	0.184
95% BCA Bootstrap UCL	0.185	95% Bootstrap t UCL	0.185
95% H-UCL (Log ROS)	0.196		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.997	KM Geo Mean	0.136
KM SD (logged)	0.616	95% Critical H Value (KM-Log)	2.016
KM Standard Error of Mean (logged)	0.099	95% H-UCL (KM -Log)	0.2
KM SD (logged)	0.616	95% Critical H Value (KM-Log)	2.016
KM Standard Error of Mean (logged)	0.099		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.155	Mean in Log Scale	-2.136
SD in Original Scale	0.0899	SD in Log Scale	0.867
95% t UCL (Assumes normality)	0.179	95% H-Stat UCL	0.236

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	0.182

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.

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Dieldrin

General Statistics

Total Number of Observations	40	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	40
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin was not processed!

gamma-BHC (Lindane)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	17
Number of Detects	30	Number of Non-Detects	10
Number of Distinct Detects	16	Number of Distinct Non-Detects	1
Minimum Detect	0.07	Minimum Non-Detect	0.05
Maximum Detect	0.25	Maximum Non-Detect	0.05
Variance Detects	0.00239	Percent Non-Detects	25%
Mean Detects	0.124	SD Detects	0.0489
Median Detects	0.11	CV Detects	0.395
Skewness Detects	1.267	Kurtosis Detects	0.702
Mean of Logged Detects	-2.156	SD of Logged Detects	0.354

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.838	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.927	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.159	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

KM Mean	0.105	KM Standard Error of Mean	0.00843
KM SD	0.0524	95% KM (BCA) UCL	0.119
95% KM (t) UCL	0.119	95% KM (Percentile Bootstrap) UCL	0.119
95% KM (z) UCL	0.119	95% KM Bootstrap t UCL	0.121
90% KM Chebyshev UCL	0.13	95% KM Chebyshev UCL	0.142
97.5% KM Chebyshev UCL	0.158	99% KM Chebyshev UCL	0.189

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.196	**Anderson-Darling GOF Test**	

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

5% A-D Critical Value	0.746	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.213	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.16	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)	7.885	k star (bias corrected MLE)	7.119
Theta hat (MLE)	0.0157	Theta star (bias corrected MLE)	0.0174
nu hat (MLE)	473.1	nu star (bias corrected)	427.1
Mean (detects)	0.124		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.101
Maximum	0.25	Median	0.1
SD	0.0586	CV	0.581
k hat (MLE)	2.503	k star (bias corrected MLE)	2.332
Theta hat (MLE)	0.0403	Theta star (bias corrected MLE)	0.0432
nu hat (MLE)	200.2	nu star (bias corrected)	186.6
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (186.56, α)	156	Adjusted Chi Square Value (186.56, β)	154.9
95% Gamma Approximate UCL (use when n>=50)	0.121	95% Gamma Adjusted UCL (use when n<50)	0.121

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.105	SD (KM)	0.0524
Variance (KM)	0.00275	SE of Mean (KM)	0.00843
k hat (KM)	4.028	k star (KM)	3.743
nu hat (KM)	322.3	nu star (KM)	299.4
theta hat (KM)	0.0261	theta star (KM)	0.0281
80% gamma percentile (KM)	0.146	90% gamma percentile (KM)	0.178
95% gamma percentile (KM)	0.208	99% gamma percentile (KM)	0.271

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (299.42, α)	260.3	Adjusted Chi Square Value (299.42, β)	259
95% Gamma Approximate KM-UCL (use when n>=50)	0.121	95% Gamma Adjusted KM-UCL (use when n<50)	0.122

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.927	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.191	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.159	Detected Data Not Lognormal at 5% Significance Level

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Detected Data Not Lognormal at 5% Significance Level

Attachment A-3c
ProUCL Output for Sitewide Pesticides in Surface Water

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.105	Mean in Log Scale	-2.364
SD in Original Scale	0.0529	SD in Log Scale	0.486
95% t UCL (assumes normality of ROS data)	0.12	95% Percentile Bootstrap UCL	0.12
95% BCA Bootstrap UCL	0.12	95% Bootstrap t UCL	0.121
95% H-UCL (Log ROS)	0.123		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.366	KM Geo Mean	0.0939
KM SD (logged)	0.472	95% Critical H Value (KM-Log)	1.9
KM Standard Error of Mean (logged)	0.076	95% H-UCL (KM -Log)	0.121
KM SD (logged)	0.472	95% Critical H Value (KM-Log)	1.9
KM Standard Error of Mean (logged)	0.076		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0989	Mean in Log Scale	-2.539
SD in Original Scale	0.0604	SD in Log Scale	0.738
95% t UCL (Assumes normality)	0.115	95% H-Stat UCL	0.133

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	0.119	KM H-UCL	0.121
95% KM (BCA) UCL	0.119		

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.

Attachment A-3d
Surface Water Total Metals ProUCL Data Set

Row Labels	UOM	Arsenic(T)	D_Arsenic(T)	Copper(T)	D_Copper(T)	Lead(T)	D_Lead(T)	Zinc(T)	D_Zinc(T)
SW-2010-10-0517	mg/L	0.005	0	0.007052083	1	0.002	0	0.483772819	1
SW-2010-10-0616	mg/L	0.005	0	0.00490625	1	0.002	0	0.412778905	1
SW-2010-10-1116	mg/L	0.005	0	0.006864583	1	0.002	0	0.564908722	1
SW-2010-10-1117	mg/L	0.00534	1	0.008895833	1	0.002	0	0.148073022	1
SW-2010-11-0517	mg/L	0.005	0	0.006572917	1	0.002	0	0.478701826	1
SW-2010-11-0616	mg/L	0.005	0	0.054895833	1	0.002	0	1.622718053	1
SW-2010-11-1116	mg/L	0.005	0	0.266666667	1	0.002	0	6.004056795	1
SW-2010-11-1117	mg/L	0.00539	1	0.0225	1	0.002	0	0.418864097	1
SW-2010-14-0517	mg/L	0.005	0	0.0184375	1	0.002	0	1.196754564	1
SW-2010-14-0616	mg/L	0.005	0	0.020520833	1	0.002	0	1.288032454	1
SW-2010-14-1116	mg/L	0.005	0	0.050416667	1	0.002	0	1.39959432	1
SW-2010-14-1117	mg/L	0.005	0	0.034583333	1	0.002	0	0.80020284	1
SW-2010-15-0517	mg/L	0.005	0	0.01625	1	0.002	0	1.054766734	1
SW-2010-15-0616	mg/L	0.005	0	0.023125	1	0.002	0	1.30831643	1
SW-2010-15-1116	mg/L	0.005	0	0.02875	1	0.002	0	1.45030426	1
SW-2010-15-1117	mg/L	0.005	0	0.030104167	1	0.002	0	0.647058824	1
SW-2010-17-0517	mg/L	0.005	0	0.011979167	1	0.002	0	0.880324544	1
SW-2010-17-0616	mg/L	0.005	0	0.012083333	1	0.002	0	0.902636917	1
SW-2010-17-1116	mg/L	0.005	0	0.0171875	1	0.002	0	1.21703854	1
SW-2010-17-1117	mg/L	0.005	0	0.0234375	1	0.002	0	0.467545639	1
SW-2010-5-0517	mg/L	0.005	0	0.00875	1	0.002	0	0.586206897	1
SW-2010-5-0616	mg/L	0.005	0	0.005583333	1	0.002	0	0.511156187	1
SW-2010-5-1116	mg/L	0.005	0	0.007354167	1	0.002	0	0.80020284	1
SW-2010-5-1117	mg/L	0.00611	1	0.00925	1	0.002	0	0.19168357	1
SW-2014-20-0517	mg/L	0.005	0	0.260416667	1	0.002	0	4.563894523	1
SW-2014-20-0616	mg/L	0.005	0	0.530208333	1	0.002	0	7.809330629	1
SW-2014-20-1116	mg/L	0.005	0	0.667708333	1	0.002	0	11.96754564	1
SW-2014-20-1117	mg/L	0.005	0	0.203125	1	0.002	0	5.314401623	1
SW-2014-21-0517	mg/L	0.005	0	0.7875	1	0.002	0	9.807302231	1
SW-2014-21-0616	mg/L	0.005	0	0.710416667	1	0.002	0	8.569979716	1
SW-2014-21-1116	mg/L	0.005	0	0.938541667	1	0.002	0	12.57606491	1
SW-2014-21-1117	mg/L	0.005	0	0.127083333	1	0.002	0	2.677484787	1
SW-2010-10-0518	mg/L	0.005	0	0.010239583	1	0.002	0	0.192697769	1
SW-2010-11-0518	mg/L	0.005	0	0.013229167	1	0.002	0	0.184584178	1
SW-2010-14-0518	mg/L	0.005	0	0.025208333	1	0.002	0	0.731237323	1
SW-2010-15-0518	mg/L	0.005	0	0.023958333	1	0.002	0	0.65010142	1
SW-2010-17-0518	mg/L	0.005	0	0.026145833	1	0.002	0	0.595334686	1
SW-2010-5-0518	mg/L	0.005	0	0.0100625	1	0.002	0	0.311359026	1
SW-2014-20-0518	mg/L	0.005	0	0.123958333	1	0.002	0	3.245436105	1
SW-2014-21-0518	mg/L	0.005	0	0.145833333	1	0.002	0	3.45841785	1

Attachment A-3e
ProUCL Output for Sitewide Metals (total) in Surface Water

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/21/2018 11:41:47 AM
From File	2018_06_21 Eco SW ('16-'18) ProUCL input tMETALS ONLY - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Copper(T)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	40
		Number of Missing Observations	0
Minimum	0.00491	Mean	0.132
Maximum	0.939	Median	0.0233
SD	0.242	Std. Error of Mean	0.0382
Coefficient of Variation	1.824	Skewness	2.246

Normal GOF Test

Shapiro Wilk Test Statistic	0.578	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.139	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	0.197	95% Adjusted-CLT UCL (Chen-1995)	0.21
		95% Modified-t UCL (Johnson-1978)	0.199

Gamma GOF Test

A-D Test Statistic	3.481	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.817	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.277	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.148	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.484	k star (bias corrected MLE)	0.464
Theta hat (MLE)	0.274	Theta star (bias corrected MLE)	0.285
nu hat (MLE)	38.71	nu star (bias corrected)	37.14
MLE Mean (bias corrected)	0.132	MLE Sd (bias corrected)	0.194
		Approximate Chi Square Value (0.05)	24.19
Adjusted Level of Significance	0.044	Adjusted Chi Square Value	23.79

Attachment A-3e
ProUCL Output for Sitewide Metals (total) in Surface Water

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.203	95% Adjusted Gamma UCL (use when n<50)	0.207

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.877	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.139	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-5.317	Mean of logged Data	-3.341
Maximum of Logged Data	-0.0634	SD of logged Data	1.559

Assuming Lognormal Distribution

95% H-UCL	0.261	90% Chebyshev (MVUE) UCL	0.221
95% Chebyshev (MVUE) UCL	0.271	97.5% Chebyshev (MVUE) UCL	0.339
99% Chebyshev (MVUE) UCL	0.474		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.195	95% Jackknife UCL	0.197
95% Standard Bootstrap UCL	0.196	95% Bootstrap-t UCL	0.229
95% Hall's Bootstrap UCL	0.199	95% Percentile Bootstrap UCL	0.198
95% BCA Bootstrap UCL	0.212		
90% Chebyshev(Mean, Sd) UCL	0.247	95% Chebyshev(Mean, Sd) UCL	0.299
97.5% Chebyshev(Mean, Sd) UCL	0.371	99% Chebyshev(Mean, Sd) UCL	0.513

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	0.299

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.

Attachment A-3e
ProUCL Output for Sitewide Metals (total) in Surface Water

Zinc(T)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	39
		Number of Missing Observations	0
Minimum	0.148	Mean	2.437
Maximum	12.58	Median	0.891
SD	3.321	Std. Error of Mean	0.525
Coefficient of Variation	1.362	Skewness	1.923

Normal GOF Test

Shapiro Wilk Test Statistic	0.675	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.322	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.139	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	3.322	95% Adjusted-CLT UCL (Chen-1995)	3.471
		95% Modified-t UCL (Johnson-1978)	3.348

Gamma GOF Test

A-D Test Statistic	1.984	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.787	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.215	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.145	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.797	k star (bias corrected MLE)	0.754
Theta hat (MLE)	3.058	Theta star (bias corrected MLE)	3.233
nu hat (MLE)	63.76	nu star (bias corrected)	60.31
MLE Mean (bias corrected)	2.437	MLE Sd (bias corrected)	2.807
		Approximate Chi Square Value (0.05)	43.45
Adjusted Level of Significance	0.044	Adjusted Chi Square Value	42.92

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3.383	95% Adjusted Gamma UCL (use when n<50)	3.425

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.126	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.139	Data appear Lognormal at 5% Significance Level

Attachment A-3e
ProUCL Output for Sitewide Metals (total) in Surface Water

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.91	Mean of logged Data	0.146
Maximum of Logged Data	2.532	SD of logged Data	1.21

Assuming Lognormal Distribution

95% H-UCL	4.03	90% Chebyshev (MVUE) UCL	3.973
95% Chebyshev (MVUE) UCL	4.715	97.5% Chebyshev (MVUE) UCL	5.745
99% Chebyshev (MVUE) UCL	7.769		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.301	95% Jackknife UCL	3.322
95% Standard Bootstrap UCL	3.291	95% Bootstrap-t UCL	3.595
95% Hall's Bootstrap UCL	3.406	95% Percentile Bootstrap UCL	3.307
95% BCA Bootstrap UCL	3.505		
90% Chebyshev(Mean, Sd) UCL	4.012	95% Chebyshev(Mean, Sd) UCL	4.726
97.5% Chebyshev(Mean, Sd) UCL	5.716	99% Chebyshev(Mean, Sd) UCL	7.661

Suggested UCL to Use

95% H-UCL 4.03

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

ATTACHMENT B

Surface Water Dissolved to Total Metals Conversion Calculations

ATTACHMENT B
SURFACE WATER DISSOLVED TO TOTAL METALS CALCULATIONS
Former Estech Chemicals Site
Atlanta, GA

		Arsenic		Copper		Lead[1]		Zinc	
Sample	**UOM**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**
SW-2010-10-0517	mg/L	*0.005*	*0.005*	0.00677	0.00705	*0.001*	*0.002*	0.477	0.484
SW-2010-10-0616	mg/L	*0.005*	*0.005*	0.00471	0.00491	*0.001*	*0.002*	0.407	0.413
SW-2010-10-1116	mg/L	*0.005*	*0.005*	0.00659	0.00686	*0.001*	*0.002*	0.557	0.565
SW-2010-10-1117	mg/L	0.00534	0.00534	0.00854	0.00890	*0.001*	*0.002*	0.146	0.148
SW-2010-11-0517	mg/L	*0.005*	*0.005*	0.00631	0.00657	*0.001*	*0.002*	0.472	0.479
SW-2010-11-0616	mg/L	*0.005*	*0.005*	0.0527	0.0549	*0.001*	*0.002*	1.60	1.62
SW-2010-11-1116	mg/L	*0.005*	*0.005*	0.256	0.267	*0.001*	*0.002*	5.92	6.00
SW-2010-11-1117	mg/L	0.00539	0.00539	0.0216	0.0225	*0.001*	*0.002*	0.413	0.419
SW-2010-14-0517	mg/L	*0.005*	*0.005*	0.0177	0.0184	*0.001*	*0.002*	1.18	1.20
SW-2010-14-0616	mg/L	*0.005*	*0.005*	0.0197	0.0205	*0.001*	*0.002*	1.27	1.29
SW-2010-14-1116	mg/L	*0.005*	*0.005*	0.0484	0.0504	*0.001*	*0.002*	1.38	1.40
SW-2010-14-1117	mg/L	*0.005*	*0.005*	0.0332	0.0346	*0.001*	*0.002*	0.789	0.800
SW-2010-15-0517	mg/L	*0.005*	*0.005*	0.0156	0.0163	*0.001*	*0.002*	1.04	1.05
SW-2010-15-0616	mg/L	*0.005*	*0.005*	0.0222	0.0231	*0.001*	*0.002*	1.29	1.31
SW-2010-15-1116	mg/L	*0.005*	*0.005*	0.0276	0.0288	*0.001*	*0.002*	1.43	1.45
SW-2010-15-1117	mg/L	*0.005*	*0.005*	0.0289	0.0301	*0.001*	*0.002*	0.638	0.647
SW-2010-17-0517	mg/L	*0.005*	*0.005*	0.0115	0.0120	*0.001*	*0.002*	0.868	0.880
SW-2010-17-0616	mg/L	*0.005*	*0.005*	0.0116	0.0121	*0.001*	*0.002*	0.89	0.90
SW-2010-17-1116	mg/L	*0.005*	*0.005*	0.0165	0.0172	*0.001*	*0.002*	1.2	1.2
SW-2010-17-1117	mg/L	*0.005*	*0.005*	0.0225	0.0234	*0.001*	*0.002*	0.461	0.468
SW-2010-5-0517	mg/L	*0.005*	*0.005*	0.0084	0.0088	*0.001*	*0.002*	0.578	0.586
SW-2010-5-0616	mg/L	*0.005*	*0.005*	0.00536	0.00558	*0.001*	*0.002*	0.504	0.511
SW-2010-5-1116	mg/L	*0.005*	*0.005*	0.00706	0.00735	*0.001*	*0.002*	0.789	0.800
SW-2010-5-1117	mg/L	0.00611	0.00611	0.00888	0.00925	*0.001*	*0.002*	0.189	0.192
SW-2014-20-0517	mg/L	*0.005*	*0.005*	0.25	0.26	*0.001*	*0.002*	4.5	4.6
SW-2014-20-0616	mg/L	*0.005*	*0.005*	0.509	0.530	*0.001*	*0.002*	7.7	7.8
SW-2014-20-1116	mg/L	*0.005*	*0.005*	0.641	0.668	*0.001*	*0.002*	11.8	12.0
SW-2014-20-1117	mg/L	*0.005*	*0.005*	0.195	0.203	*0.001*	*0.002*	5.24	5.31
SW-2014-21-0517	mg/L	*0.005*	*0.005*	0.756	0.788	*0.001*	*0.002*	9.67	9.81
SW-2014-21-0616	mg/L	*0.005*	*0.005*	0.682	0.710	*0.001*	*0.002*	8.45	8.57
SW-2014-21-1116	mg/L	*0.005*	*0.005*	0.901	0.939	*0.001*	*0.002*	12.4	12.58
SW-2014-21-1117	mg/L	*0.005*	*0.005*	0.122	0.127	*0.001*	*0.002*	2.64	2.68
SW-2010-10-0518	mg/L	*0.005*	*0.005*	0.00983	0.0102	*0.001*	*0.002*	0.190	0.193
SW-2010-11-0518	mg/L	*0.005*	*0.005*	0.0127	0.0132	*0.001*	*0.002*	0.182	0.185
SW-2010-14-0518	mg/L	*0.005*	*0.005*	0.0242	0.0252	*0.001*	*0.002*	0.721	0.731
SW-2010-15-0518	mg/L	*0.005*	*0.005*	0.023	0.024	*0.001*	*0.002*	0.641	0.650
SW-2010-17-0518	mg/L	*0.005*	*0.005*	0.0251	0.0261	*0.001*	*0.002*	0.587	0.595
SW-2010-5-0518	mg/L	*0.005*	*0.005*	0.00966	0.0101	*0.001*	*0.002*	0.307	0.311
SW-2014-20-0518	mg/L	*0.005*	*0.005*	0.119	0.124	*0.001*	*0.002*	3.20	3.25
SW-2014-21-0518	mg/L	*0.005*	*0.005*	0.14	0.15	*0.001*	*0.002*	3.41	3.46

Notes:

1) An average hardness of 250.3 mg/L as $CaCO_3$ was used for Lead; refer to Table D-3b for details.

Conversion factors (CFs) based on US EPA (2018) Region 4 ERA Guidance Table 1b CFs for freshwater chronic values.

Italicized values indicates a non-detect; value is the reporting limit

mg/L = milligrams per liter

Total Metals = Dissolved Metals (CF^{-1})

Prepared by/Date: LO 06/21/2018
Checked by/Date: IMR 06/21/2018

ATTACHMENT C

ProUCL Calculations - Surficial Soil by Shrew Soil Exposure Unit

C-1a ProUCL Data Set for Surficial Soil by Shrew Exposure Unit

C-1b ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

C-1c ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Units

Attachment C-1a
ProUCL Data Set for Surficial Soil by Shrew Exposure Unit

SID	LOC_ID	EU_SHREW	UOM	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	alpha-BHC	D_alpha-BHC	alpha-Chlordane	D_alpha-Chlordane	Arsenic	D_Arsenic	beta-BHC	D_beta-BHC	Copper	D_Copper	delta-BHC	D_delta-BHC	Dieldrin	D_Dieldrin	gamma-BHC (Lindane)	D_gamma-BHC (Lindane)	gamma-Chlordane	D_gamma-Chlordane	Heptachlor	D_Heptachlor	Lead	D_Lead	Methoxychlor	D_Methoxychlor	Toxaphene	D_Toxaphene	Zinc	D_Zinc
A22 (0-1) 020918	A22	SO-11	mg/kg	0.52	1	3	1	19	1	0.13	0	0.13	0	45.5	1	0.13	0	120	1	0.13	0	0.26	1	0.13	0	0.13	0	0.13	0	412	1	1.3	0	130	0	446	1
A23 (0-1) 020918	A23	SO-11	mg/kg	0.049	0	0.07	1	0.12	1	0.025	0	0.025	0	14	1	0.025	0	93	1	0.025	0	0.049	0	0.025	0	0.025	0	0.025	0	98.5	1	0.25	0	2.5	0	134	1
A24 (0-1) 020918	A24	SO-11	mg/kg	0.051	1	0.16	1	2.1	1	0.012	0	0.012	0	18.4	1	0.012	0	117	1	0.012	0	0.023	0	0.012	0	0.012	0	0.012	0	180	1	0.12	0	1.4	1	524	1
A25 (0-1) 020918	A25	SO-11	mg/kg	0.046	0	0.1	1	0.15	1	0.023	0	0.023	0	11.8	1	0.023	0	87.4	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	102	1	0.23	0	2.3	0	259	1
A26 (0-1) 020918	A26	SO-14	mg/kg	0.084	0	0.68	1	0.19	1	0.042	0	0.042	0	28	1	0.042	0	62.3	1	0.042	0	0.084	0	0.042	0	0.042	0	0.042	0	407	1	0.42	0	4.2	0	168	1
B10 (0-1) 020918	B10	SO-05	mg/kg	0.21	0	0.67	1	1.9	1	0.11	0	0.11	0	7.46	0	0.12	1	15.1	1	0.11	0	0.21	0	0.11	0	0.11	0	0.11	0	38.6	1	1.1	0	11	0	91.8	1
B11 (0-1) 020918	B11	SO-05	mg/kg	0.079	0	0.24	1	1.1	1	0.04	0	0.04	0	7.44	0	0.11	1	18.5	1	0.04	0	0.079	0	0.04	0	0.04	0	0.04	0	38.1	1	0.4	0	4	0	84	1
B12 (0-1) 020918	B12	SO-05	mg/kg	0.084	0	0.092	1	0.14	1	0.042	0	0.042	0	24.3	1	0.042	0	43.9	1	0.042	0	0.084	0	0.042	0	0.042	0	0.042	0	204	1	0.42	0	4.2	0	134	1
B22 (0-1) 020818	B22	SO-11	mg/kg	0.009	0	0.078	1	0.091	1	0.0045	0	0.0045	0	74.8	1	0.0045	0	161	1	0.0045	0	0.009	0	0.0045	0	0.0045	0	0.0045	0	486	1	0.045	0	0.45	0	309	1
B23 (0-1) 020818	B23	SO-11	mg/kg	1.1	1	1.2	1	16	1	0.061	1	0.22	1	23.5	1	0.055	1	99.1	1	0.051	0	0.35	1	0.051	0	0.46	1	0.051	0	300	1	5.1	0	51	0	460	1
B24 (0-1) 020818	B24	SO-11	mg/kg	0.078	1	0.99	1	1	1	0.0047	0	0.0087	1	11.3	1	0.0047	0	66	1	0.0047	0	0.016	1	0.0047	0	0.0047	0	0.0047	0	126	1	1.2	0	0.49	1	146	1
B25 (0-1) 020818	B25	SO-11	mg/kg	0.029	0	0.42	1	0.38	1	0.015	0	0.015	0	62	1	0.015	0	117	1	0.015	0	0.029	0	0.015	0	0.015	0	0.015	0	257	1	0.15	0	1.5	0	506	1
B26 (0-1) 020818	B26	SO-14	mg/kg	0.0087	0	0.011	1	0.0087	0	0.0043	0	0.0043	0	7.4	0	0.0043	0	48.1	1	0.0043	0	0.0087	0	0.0043	0	0.0043	0	0.0043	0	71.1	1	0.043	0	0.43	0	101	1
B27 (0-1) 020818	B27	SO-14	mg/kg	0.042	0	0.042	0	0.042	0	0.021	0	0.021	0	8.03	1	0.021	0	44.5	1	0.021	0	0.042	0	0.021	0	0.021	0	0.021	0	1030	1	0.21	0	2.1	0	173	1
B28 (0-1) 020818	B28	SO-14	mg/kg	0.027	0	0.036	1	0.029	1	0.014	0	0.014	0	65.9	1	0.016	1	129	1	0.014	0	0.027	0	0.014	0	0.014	0	0.014	0	273	1	0.14	0	1.4	0	677	1
B29 (0-1) 020818	B29	SO-14	mg/kg	0.021	0	0.021	0	0.021	0	0.011	0	0.011	0	12.5	1	0.011	0	55.8	1	0.011	0	0.021	0	0.011	0	0.011	0	0.011	0	92.8	1	0.11	0	1.1	0	315	1
C10 (0-1) 021418	C10	SO-05	mg/kg	0.23	1	1.1	1	2.6	1	0.095	0	0.095	0	11.3	1	0.095	0	27.1	1	0.095	0	0.19	0	0.095	0	0.095	0	0.095	0	69.2	1	0.95	0	9.5	0	94.5	1
C11 (0-1) 020918	C11	SO-05	mg/kg	0.038	0	0.11	1	0.19	1	0.019	0	0.019	0	7.44	0	0.019	0	13.3	1	0.019	0	0.038	0	0.019	0	0.019	0	0.019	0	37.9	1	0.19	0	19	0	61.8	1
C12 (0-1) 020918	C12	SO-05	mg/kg	0.02	0	0.098	1	0.2	1	0.01	0	0.01	0	7.43	0	0.01	0	16.9	1	0.01	0	0.032	1	0.01	0	0.01	0	0.01	0	57.2	1	0.1	0	1	0	79.9	1
C13 (0-1) 020918	C13	SO-05	mg/kg	0.044	0	0.044	0	0.069	1	0.022	0	0.022	0	17.2	1	0.022	0	16.4	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	65.7	1	0.22	0	2.2	0	49.7	1
C14 (0-1) 020918	C14	SO-07	mg/kg	0.043	0	0.093	1	0.27	1	0.021	0	0.021	0	41.2	1	0.021	0	43.9	1	0.021	0	0.055	1	0.021	0	0.021	0	0.021	0	126	1	0.21	0	2.1	0	128	1
C15 (0-1) 020818	C15	SO-07	mg/kg	0.024	0	0.024	0	0.3	1	0.012	0	0.012	0	7.46	0	0.021	1	25.1	1	0.012	0	0.024	0	0.012	0	0.021	1	0.012	1	35.4	1	0.12	0	1.2	0	65.6	1
C16 (0-1) 020818	C16	SO-07	mg/kg	0.088	0	0.088	0	0.18	1	0.044	0	0.044	0	7.39	0	0.044	0	32.6	1	0.044	0	0.088	0	0.044	0	0.044	0	0.044	0	56.4	1	0.44	0	4.4	0	67.1	1
C17 (0-1) 020818	C17	SO-07	mg/kg	0.44	0	0.79	1	4.9	1	0.22	0	0.22	0	34.6	1	0.84	1	85.4	1	0.22	0	0.44	0	0.22	0	0.22	0	0.22	0	217	1	2.2	0	22	0	215	1
C18 (0-1) 020818	C18	SO-09	mg/kg	0.0073	0	0.11	1	0.13	1	0.0036	0	0.012	1	7.47	0	0.0036	0	6.98	1	0.0036	0	0.018	1	0.0036	0	0.016	1	0.0036	0	14.9	1	0.036	0	0.74	1	32.7	1
C19 (0-1) 020818	C19	SO-09	mg/kg	0.0041	0	0.036	1	0.12	1	0.002	0	0.042	1	7.4	0	0.0037	1	23.7	1	0.002	0	0.41	0	0.002	0	0.063	1	0.002	0	33.8	1	0.02	0	20	0	44.4	1
C20 (0-1) 020818	C20	SO-09	mg/kg	27	1	25	1	1600	1	4.9	0	23	1	105	1	56	1	460	1	4.9	0	29	1	4.9	0	69	1	41	1	1330	1	49	0	490	0	784	1
C21 (0-1) 020818	C21	SO-09	mg/kg	0.0043	0	0.055	1	0.15	1	0.0022	0	0.0055	1	36.5	1	0.021	1	151	1	0.0022	0	0.055	1	0.0022	0	0.019	1	0.0022	0	1340	1	0.022	0	0.25	1	166	1
C22 (0-1) 020818	C22	SO-12	mg/kg	0.095	1	0.33	1	2.6	1	0.046	0	0.046	0	102	1	0.063	1	351	1	0.046	0	0.26	1	0.046	0	0.094	1	0.046	0	1320	1	0.46	0	4.6	0	559	1
C23 (0-1) 020818	C23	SO-12	mg/kg	0.046	0	0.058	1	0.046	0	0.023	0	0.023	0	327	1	0.023	0	254	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	1210	1	0.23	0	2.3	0	201	1
C24 (0-1) 020818	C24	SO-12	mg/kg	0.0048	0	0.0048	0	0.075	1	0.0024	0	0.0024	0	11.1	0	0.0024	0	44.1	1	0.0024	0	0.0048	0	0.0024	0	0.0024	0	0.0024	0	22.6	1	0.024	0	0.24	0	111	0
C25 (0-1) 020818	C25	SO-12	mg/kg	0.009	0	0.009	0	0.009	0	0.0045	0	0.0045	0	288	1	0.0045	0	114	1	0.0045	0	0.009	0	0.0045	0	0.0045	0	0.0045	0	153	1	0.045	0	0.45	0	96.5	0
C26 (0-1) 020818	C26	SO-15	mg/kg	0.023	0	0.18	1	0.043	1	0.012	0	0.012	0	247	1	0.012	0	522	1	0.012	0	0.023	0	0.012	0	0.012	0	0.012	0	1530	1	0.12	0	1.2	0	1320	1
C27 (0-1) 020618	C27	SO-15	mg/kg	0.3	0	0.52	1	0.38	1	0.15	0	0.15	0	449	1	0.15	0	750	1	0.15	0	0.3	0	0.15	0	0.15	0	0.15	0	2130	1	1.5	0	15	0	1490	1
C28 (0-1) 020618	C28	SO-15	mg/kg	0.022	0	0.022	0	0.022	0	0.011	0	0.011	0	170	1	0.011	0	109	1	0.011	0	0.022	0	0.011	0	0.011	0	0.011	0	499	1	0.11	0	1.1	0	391	1
C29 (0-1) 020618	C29	SO-15	mg/kg	0.0043	0	0.0043	0	0.012	1	0.0022	0	0.0022	0	7.35	0	0.0022	0	25.5	1	0.0022	0	0.0043	0	0.0022	0	0.0022	0	0.0022	0	122	1	0.022	0	0.22	0	126	1
C3 (0-1) 021318	C3	SO-01	mg/kg	0.22	0	1	1	2.6	1	0.11	0	0.11	0	51.2	1	0.11	0	159	1	0.11	0	0.22	0	0.11	0	0.13	1	0.11	0	481	1	1.1	0	11	0	445	1
C30 (0-1) 020618	C30	SO-17	mg/kg	0.0092	0	0.0092	0	0.0092	0	0.0046	0	0.0046	0	7.14	0	0.0046	0	5.77	1	0.0046	0	0.0092	0	0.0046	0	0.0046	0	0.0046	0	49.7	1	0.046	0	0.46	0	68.6	1
C31 (0-1) 020618	C31	SO-17	mg/kg	0.023	0	0.023	0	0.023	0	0.011	0	0.011	0	26.2	1	0.011	0	37.8	1	0.011	0	0.023	0	0.011	0	0.011	0	0.011	0	295	1	0.11	0	1.1	0	134	1
C32 (0-1) 020618	C32	SO-17	mg/kg	0.023	0	0.053	1	0.037	1	0.011	0	0.011	0	68.5	1	0.011	0	52	1	0.011	0	0.023	0	0.011	0	0.011	0	0.011	0	997	1	0.11	0	1.1	0	189	1
C4 (0-1) 021318	C4	SO-01	mg/kg	0.46	1	0.5	1	4.1	1	0.11	0	0.14	1	10.2	0	0.19	1	52.3	1	0.11	0	2.1	1	0.13	1	0.16	1	0.11	0	59.1	1	1.1	0	21	1	96.5	1
C5 (0-1) 021318	C5	SO-01	mg/kg	0.36	1	0.64	1	5.8	1	0.11	0	0.22	1	175	1	0.44	1	130	1	0.11	0	0.63	1	0.11	0	0.2	1	0.11	0	957	1	1.1	0	17	1	601	1
C6 (0-1) 021318	C6	SO-03	mg/kg	0.09	0	0.22	1	0.94	1	0.045	0	0.045	0	232	1	0.16	1	248	1	0.045	0	0.09	0	0.045	0	0.045	0	0.045	0	45100	1	0.45	0	4.5	0	401	1
C7 (0-1) 021318	C7	SO-03	mg/kg	0.024	0	0.074	1	0.054	1	0.012	0	0.012	0	17	1	0.015	1	48.2	1	0.012	0	0.024	0	0.012	0	0.012	0	0.012	0	166	1	0.12	0	1.2	0	158	1
C8 (0-1) 020918	C8	SO-03	mg/kg	0.36	1	1.6	1	16	1	0.08	1	0.2	1	102	1	1.3	1	268	1	0.057	1	0.63	1	0.06	1	0.61	1	0.043	0	1510	1	0.43	0	43	0	893	1
C9 (0-1) 021418	C9	SO-03	mg/kg	0.23	1	0.82	1	4.1	1	0.16	1	0.037	1	24.6	1	0.31	1	81.3	1	0.028	0	0.36	1	0.11	1	0.065	1	0.028	0	301	1	0.28	0	4.5	1	359	1
D1 (0-1) 021318	D1	SO-01	mg/kg	0.23	0	0.38	1	2.4	1	0.12	0	0.12	0	23	1	0.22	1	149	1	0.12	0	0.23	0	0.12	0	0.12	0	0.12	0	551	1	1.2	0	12	0	492	1
D10 (0-1) 020918	D10	SO-05	mg/kg	0.5	0	2.8	1	8.6	1	0.25	0	0.25	0	12.7	1	0.25	0	54.1	1	0.25	0	0.5	0	0.25	0	0.25	0	0.25	0	219	1	2.5	0	25	0	143	1
D11 (0-1) 020918	D11	SO-05	mg/kg	0.042	0	0.83	1	0.78	1	0.021	0	0.021	0	8	0	0.041	1	31.5	1	0.021	0	0.081	1	0.021	0	0.021	0	0.021	0	70.3	1	0.21	0	2.1	0	90	1
D12 (0-1) 020918	D12	SO-05	mg/kg	0.44	0	1.2	1	2.7	1	0.22	0	0.22	0	125	1	0.22	0	457	1	0.22	0	0.44	0	0.22	0	0.22	0	0.22	0	1720	1	2.2	0	22	0	1530	1
D13 (0-1) 020918	D13	SO-05	mg/kg	0.22	1	1.2	1	2.6	1	0.1	0	0.1	0	64.8	1	0.1	0	327	1	0.1	0	0.47	1	0.1	0	0.22	1	0.1	0	1110	1	1	0	10	0	971	1
D14 (0-1) 020918	D14	SO-07	mg/kg	0.39	1	1.8	1	4.6	1	0.11	0	0.25	1	65.3	1	0.13	1	283	1	0.11	0	1.3	1	0.11	0	0.28	1	0.11	0	990	1	1.1	0	16	1	1110	1
D15 (0-1) 020818	D15	SO-07	mg/kg	0.088	0	0.28	1	1.1	1	0.044	0	0.044	0	35.5	1	0.044	0	94.3	1	0.044	0	0.088	0	0.044	0	0.044	0	0.044	0	328	1	0.44	0	4.4	0	269	1
D16 (0-1) 020818	D16	SO-07	mg/kg	0.45	0	0.45	0	1.4	1	0.23	0	0.23	0	61	1	0.23	0	239	1	0.23	0	0.45	0	0.23	0	0.23	0	0.23	0	793	1	2.3	0	23	0	767	1
D17 (0-1) 020918	D17	SO-07	mg/kg	7.6	0	7.6	0	130	1	3.8	0	11	1	84.6	1	31	1	86.7	1	3.8	0	24	1	3.8	0	17	1	21	1	665	1	38	0	380	0	153	1
D18 (0-1) 020818	D18	SO-09	mg/kg	0.43	0	2.3	1	43	0	0.61	1	3.2	1	312	1	4.5	1	526	1	0.21	0	8.9	1	0.44	1	4.4	1	2.8	1	3600	1	2.1	0	2100	0	599	1
D19 (0-1) 020818	D19	SO-09	mg/kg	4.4	0	4.4	0	14	1	2.2	0	3.9	1	41.9	1	2.2	0	118	1	2.2	0	4.4	0	2.2	0	4.2	1	2.2	0	59.7	1	22	0	220	0	220	1
D2 (0-1) 021318	D2	SO-01	mg/kg	0.094	0	0.58	1	1.5	1	0.047	0	0.047	0	29.9	1	0.051	1	183	1	0.047	0	0.098	1	0.047	0	0.047	0	0.047	0	299	1	0.47	0	4.7	0	491	1
D20 (0-1) 020818	D20	SO-09	mg/kg	0.79	1	1.3	1	19	1	0.24	0	1.3	1	176	1	0.29	1	488	1	0.24	0	1.1	1	0.24	0	1.6	1	0.24	0	1350	1	24	0	240	0	960	1
D21 (0-1) 020818	D21	SO-09	mg/kg	0.69	1	1	1	9.5	1	0.12	1	0.51	1	90.5	1	0.93	1	143	1	0.11	0	1.3	1	0.11	0	0.91	1	0.13	1	503	1	11	0	110	0	521	1
D22 (0-1) 020818	D22	SO-12	mg/kg	0.88	1	1	1	19	1	0.14	1	0.18	1	188	1	0.59	1	606	1	0.061	1	0.9	1	0.064	1	0.84	1	0.4	1	2550	1	4.4	0	44	0	919	1
D23 (0-1) 020818	D23	SO-12	mg/kg	0.046	0	0.046	0	0.046	0	0.023	0	0.023	0	9.97	0	0.023	0	118	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	180	1	0.23	0	2.3	0	901	1
D24 (0-1) 020818	D24	SO-12	mg/kg	0.01	0	0.01	0	0.012	1	0.0052	0	0.0052	0	106	1	0.0052	0	308	1	0.0052	0	0.01	0	0.0052	0	0.0052	0	0.0052	0	708	1	0.052	0	0.52	0	358	1
D25 (0-1) 020818	D25	SO-12	mg/kg	0.044	0	0.044	0	0.044	0	0.022	0	0.022	0	9.55	0	0.022	0	77.1	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	131	1	0.22	0	2.2	0	415	1
D26 (0-1) 020818	D26	SO-15	mg/kg	0.025	0	0.06	1	0.05	1	0.013	0	0.013	0	1140	1	0.013	0	141	1	0.013	0	0.025	0	0.013	0	0.013	0	0.013	0	8170	1	0.13	0	1.3	0	210	1
D27 (0-1) 020618	D27	SO-15	mg/kg	0.042	0	0.12	1	0.059	1	0.021	0	0.021	0	135	1	0.021	0	139	1	0.021	0	0.042	0	0.021	0	0.021	0	0.021	0	3740	1	0.21	0	2.1	0	186	1
D28 (0-1) 020618	D28	SO-15	mg/kg	0.047	0	0.3	1	0.14	1	0.024	0	0.024	0	277	1	0.024	0	121	1	0.024	0	0.047	0	0.024	0	0.024	0	0.024	0	65600	1	0.24	0	2.4	0	189	1
D29 (0-1) 020618	D29	SO-15	mg/kg	0.0046	0	0.0046	0	0.0046	0	0.0023	0	0.0023	0	11.6	0	0.0023	0	22.1	1	0.0023	0	0.0046	0	0.0023	0	0.0023	0	0.0023	0	51.4	1	0.023	0	0.23	0	144	1
D3 (0-1) 021318	D3	SO-01	mg/kg	0.21	0	0.21	0	0.35	1	0.11	0	0.11	0	39.5	1	0.49	1	107	1	0.11	0	0.21	0	0.11	0	0.11	0	0.11	0	361	1	1.1	0	11	0	162	1
D30 (0-1) 020618	D30	SO-17	mg/kg	0.022	0	0.086	1	0.065	1	0.011	0	0.011	0	13.4	1	0.011	0	22.4	1	0.011	0	0.022	0	0.011	0	0.011	0	0.011	0	270	1	0.11	0	1.1	0	122	1
D31 (0-1) 020618	D31	SO-17	mg/kg	0.48	0	0.48	0	0.48	0	0.24	0	0.24	0	7.27	0	0.24	0	29.7	1	0.24	0	0.48	0	0.24	0	0.24	0	0.24	0	156	1	2.4	0	24	0	554	1
D32 (0-1) 020618	D32	SO-17	mg/kg	0.47	0	0.47	0	0.47	0	0.24	0	0.24	0	7.48	0	0.24	0	22.1	1	0.24	0	0.47	0	0.24	0	0.24	0	0.24	0	222	1	2.4	0	24	0	533	1
D33 (0-1) 020618	D33	SO-17	mg/kg	0.47	1	0.7	1	8	1	0.22	0	0.22	0	12.9	1	0.22	0	24.3	1	0.22	0	0.43	0	0.22	0	0.22	0	0.22	0	210	1	2.2	0	22	0	192	1
D34 (0-1) 020618	D34	SO-17	mg/kg	0.0085	0	0.038	1	0.014	1	0.0043	0	0.0043	0	27.2	1	0.0043	0	28.7	1	0.0043	0	0.0085	0	0.0043	0	0.0043	0	0.0043	0	84.7	1	0.043	0	0.43	0	63.6	1
D4 (0-1) 021418	D4	SO-01	mg/kg	0.038	0	0.038	0	0.038	0	0.019	0	0.019	0	664	1	0.019	0	1790	1	0.019	0	0.038	0	0.019	0	0.019	0	0.019	0	7080	1	0.19	0	1.9	0	2680	1
D5 (0-1) 021318	D5	SO-01	mg/kg	0.043	0	0.043	0	0.043	0	0.022	0	0.022	0	871	1	0.022	0	1240	1	0.022	0	0.043	0	0.022	0	0.022	0	0.022	0	7990	1	0.22	0	2.2	0	2310	1
D6 (0-1) 021318	D6	SO-03	mg/kg	0.11	1	0.13	1	0.84	1	0.021	0	0.021	0	13.4	1	0.021	0	39.9	1	0.021	0	0.05	1	0.021	0	0.029	1	0.021	0	107	1	0.21	0	2.1	0	124	1
D7 (0-1) 021318	D7	SO-03	mg/kg	0.088	1	0.42	1	1.5	1	0.076	1	0.042	0	74.4	1	0.61	1	224	1	0.042	0	0.083	0	0.042	0	0.042	0	0.042	0	737	1	0.42	0	8.9	1	403	1
D8 (0-1) 021318	D8	SO-03	mg/kg	0.22	0	0.67	1	1.1	1	0.11	0	0.11	0	152	1	0.15	1	784	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	2610	1	1.1	0	11	0	3130	1
D9 (0-1) 021318	D9	SO-03	mg/kg	0.23	0	0.8	1	4.4	1	0.11	0	0.11	0	105	1	1.4	1	336	1	0.11	0	0.27	1	0.11	0	0.11	0	0.11	0	1820	1	1.1	0	11	0	1160	1
E10 (0-1) 020918	E10	SO-06	mg/kg	0.21	0	2.1	1	2.8	1	0.11	0	0.11	0	257	1	0.17	1	240	1	0.11	0	0.24	1	0.11	0	0.12	1	0.11	0	1410	1	1.1	0	11	0	587	1
E11 (0-1) 020918	E11	SO-06	mg/kg	0.2	0	0.33	1	0.96	1	0.1	0	0.1	0	495	1	0.21	1	2360	1	0.1	0	0.28	1	0.1	0	0.16	1	0.1	0	4340	1	1	0	10	0	4730	1
E12 (0-1) 020918	E12	SO-06	mg/kg	0.37	1	1.1	1	6.2	1	0.045	0	1.2	1	8.09	1	1.7	1	146	1	0.045	0	0.77	1	0.045	0	2.1	1	0.42	1	84.7	1	0.45	0	4.5	0	293	1
E13 (0-1) 020918	E13	SO-06	mg/kg	0.23	0	0.52	1	0.68	1	0.11	0	0.11	0	331	1	0.11	0	454	1	0.11	0	0.23	0	0.11	0	0.11	0	0.11	0	2820	1	1.1	0	11	0	2050	1
E14 (0-1) 020918	E14	SO-08	mg/kg	0.043	0	0.12	1	0.14	1	0.025	1	0.021	0	122	1	0.025	1	907	1	0.021	0	0.043	0	0.021	0	0.021	0	0.021	0	1060	1	0.21	0	2.1	0	933	1
E15 (0-1) 020918	E15	SO-08	mg/kg	0.043	0	0.14	1	0.21	1	0.022	0	0.022	0	66.4	1	0.022	0	411	1	0.022	0	0.043	0	0.022	0	0.022	0	0.022	0	590	1	0.22	0	2.2	0	4620	1
E16 (0-1) 020918	E16	SO-08	mg/kg	0.48	1	0.96	1	5.5	1	0.12	0	0.46	1	23.3	1	0.12	0	97.7	1	0.12	0	0.24	0	0.12	0	0.38	1	0.12	0	295	1	1.2	0	16	1	255	1
E17 (0-1) 020918	E17	SO-08	mg/kg	0.41	0	0.62	1	2.8	1	0.21	0	0.21	0	11.6	1	0.21	0	215	1	0.21	0	0.53	1	0.21	0	0.21	0	0.21	0	922	1	2.1	0	21	0	751	1
E18 (0-1) 020918	E18	SO-10	mg/kg	0.47	0	0.66	1	2	1	0.24	0	0.24	0	7.67	1	0.24	0	140	1	0.24	0	0.47	0	0.24	0	0.24	0	0.24	0	718	1	2.4	0	24	0	767	1
E19 (0-1) 020918	E19	SO-10	mg/kg	0.42	0	0.67	1	0.87	1	0.21	0	0.21	0	11.2	1	0.21	0	36.9	1	0.21	0	0.42	0	0.21	0	0.21	0	0.21	0	388	1	2.1	0	21	0	363	1
E2 (0-1) 021318	E2	SO-02	mg/kg	0.05	0	0.12	1	0.055	1	0.025	0	0.025	0	109	1	0.025	0	305	1	0.025	0	0.05	0	0.025	0	0.025	0	0.025	0	1190	1	0.25	0	2.5	0	439	1
E20 (0-1) 020918	E20	SO-10	mg/kg	0.22	0	0.22	0	0.22	0	0.11	0	0.11	0	7.42	0	0.11	0	34.2	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	92.7	1	1.1	0	11	0	141	1
E21 (0-1) 020918	E21	SO-10	mg/kg	0.22	0	0.49	1	0.68	1	0.11	0	0.11	0	15.1	1	0.11	0	629	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	1540	1	1.1	0	11	0	733	1
E22 (0-1) 020918	E22	SO-13	mg/kg	0.94	1	0.54	1	11	1	0.13	0	0.4	1	79	1	0.78	1	383	1	0.17	1	1	1	0.15	1	1	1	0.13	0	857	1	1.3	0	130	0	951	1
E23 (0-1) 020818	E23	SO-13	mg/kg	0.48	0	0.48	0	0.51	1	0.24	0	0.24	0	16.9	1	0.24	0	60.2	1	0.24	0	0.48	0	0.24	0	0.24	0	0.24	0	1020	1	2.4	0	24	0	1000	1
E24 (0-1) 020818	E24	SO-13	mg/kg	0.73	1	1.6	1	3.1	1	0.24	0	0.24	0	56.7	1	0.24	0	88.5	1	0.24	0	0.49	0	0.24	0	0.24	0	0.24	0	911	1	2.4	0	24	0	605	1
E25 (0-1) 020618	E25	SO-13	mg/kg	22	1	4.5	0	1100	1	2.3	0	2.3	0	386	1	2.3	0	332	1	2.3	0	4.5	0	2.3	0	2.3	0	2.3	0	13400	1	230	0	230	0	702	1
E26 (0-1) 020618	E26	SO-16	mg/kg	0.057	1	0.19	1	0.62	1	0.022	0	0.022	0	119	1	0.022	0	39.4	1	0.022	0	0.045	0	0.022	0	0.022	0	0.022	0	495	1	0.22	0	2.2	0	93.9	1
E27 (0-1) 020618	E27	SO-16	mg/kg	0.049	0	0.4	1	0.25	1	0.025	0	0.025	0	253	1	0.025	0	120	1	0.025	0	0.049	0	0.025	0	0.025	0	0.025	0	78400	1	0.25	0	2.5	0	230	1
E28 (0-1) 020618	E28	SO-16	mg/kg	0.044	0	0.14	1	0.14	1	0.022	0	0.022	0	41.7	1	0.022	0	45.7	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	1780	1	0.22	0	2.2	0	245	1
E29 (0-1) 020618	E29	SO-16	mg/kg	0.51	0	1.3	1	1.1	1	0.26	0	0.26	0	23.8	1	0.26	0	44	1	0.26	0	0.51	0	0.26	0	0.26	0	0.26	0	566	1	2.6	0	26	0	242	1
E3 (0-1) 021318	E3	SO-02	mg/kg	0.095	0	1.2	1	2.1	1	0.091	1	0.1	1	221	1	0.26	1	380	1	0.047	0	0.56	1	0.061	1	0.15	1	0.047	0	2460	1	0.47	0	8.7	1	753	1
E30 (0-1) 020618	E30	SO-18	mg/kg	0.45	0	0.45	0	0.45	0	0.23	0	0.23	0	8.02	1	0.23	0	23.6	1	0.23	0	0.45	0	0.23	0	0.23	0	0.23	0	353	1	2.3	0	23	0	747	1
E31 (0-1) 020618	E31	SO-18	mg/kg	0.047	0	0.07	1	0.16	1	0.024	0	0.024	0	8.09	1	0.024	0	19.2	1	0.024	0	0.047	0	0.024	0	0.024	0	0.024	0	102	1	0.24	0	2.4	0	198	1
E32 (0-1) 020618	E32	SO-18	mg/kg	0.099	0	0.18	1	0.65	1	0.05	0	0.05	0	11.4	1	0.05	0	24.6	1	0.05	0	0.099	0	0.05	0	0.05	0	0.05	0	399	1	0.5	0	5	0	890	1
E33 (0-1) 020618	E33	SO-18	mg/kg	10	1	4.2	0	340	1	2.1	0	2.1	0	10.8	1	2.1	0	17.2	1	2.1	0	4.2	0	2.1	0	2.1	0	2.1	0	120	1	210	0	210	0	127	1
E34 (0-1) 021418	E34	SO-18	mg/kg	0.0042	0	0.0074	1	0.0042	0	0.0021	0	0.0021	0	7.47	0	0.0021	0	13.3	1	0.0021	0	0.0042	0	0.0021	0	0.0021	0	0.0021	0	67.3	1	0.021	0	0.21	0	46.1	1
E35 (0-1) 021418	E35	SO-18	mg/kg	0.0041	0	0.0041	0	0.0041	0	0.0021	0	0.0021	0	7.5	0	0.0021	0	11	1	0.0021	0	0.0041	0	0.0021	0	0.0021	0	0.0021	0	33.7	1	0.021	0	0.21	0	33.9	1
E4 (0-1) 021318	E4	SO-02	mg/kg	0.097	0	0.35	1	0.38	1	0.049	0	0.049	0	154	1	0.049	0	270	1	0.049	0	0.097	0	0.049	0	0.049	0	0.049	0	1380	1	0.49	0	4.9	0	491	1
E5 (0-1) 021318	E5	SO-02	mg/kg	0.1	1	1.3	1	1.5	1	0.045	0	0.045	0	196	1	0.42	1	250	1	0.045	0	0.21	1	0.045	0	0.055	1	0.045	0	2100	1	0.45	0	8.4	1	390	1
E6 (0-1) 021318	E6	SO-04	mg/kg	0.12	1	0.63	1	3.4	1	0.043	0	0.047	1	120	1	0.1	1	195	1	0.043	0	0.31	1	0.043	0	0.12	1	0.043	0	1230	1	0.43	0	4.8	1	451	1
E7 (0-1) 021318	E7	SO-04	mg/kg	0.094	0	0.5	1	1.3	1	0.047	0	0.047	0	115	1	0.047	0	80.4	1	0.047	0	0.1	1	0.047	0	0.047	0	0.047	0	1730	1	0.47	0	4.7	0	156	1
E8 (0-1) 021318	E8	SO-04	mg/kg	0.25	1	0.33	1	12	1	0.022	1	0.021	0	573	1	0.17	1	656	1	0.021	0	0.1	1	0.021	0	0.045	1	0.047	1	8850	1	0.21	0	2.2	1	835	1
E9 (0-1) 020918	E9	SO-04	mg/kg	0.42	0	0.42	0	0.99	1	0.21	0	0.21	0	348	1	0.21	0	478	1	0.21	0	0.42	0	0.21	0	0.21	0	0.21	0	2470	1	2.1	0	21	0	788	1
F10 (0-1) 021318	F10	SO-06	mg/kg	0.21	0	0.21	0	0.21	0	0.11	0	0.11	0	173	1	0.11	0	646	1	0.11	0	0.21	0	0.11	0	0.11	0	0.11	0	1420	1	1.1	0	11	0	764	1
F11 (0-1) 021318	F11	SO-06	mg/kg	0.12	1	0.35	1	4.8	1	0.044	0	0.044	0	39.1	1	0.047	1	70	1	0.044	0	0.48	1	0.044	0	0.044	0	0.044	0	344	1	0.44	0	4.4	0	194	1
F12 (0-1) 021318	F12	SO-06	mg/kg	2.5	1	2.4	1	7.9	1	0.19	1	0.84	1	37.1	1	1	1	257	1	0.11	0	1.5	1	0.11	0	2.5	1	0.11	0	1350	1	1.1	0	11	0	583	1
F13 (0-1) 021318	F13	SO-06	mg/kg	0.41	0	0.41	0	0.97	1	0.2	0	0.2	0	308	1	0.2	0	35.4	1	0.2	0	0.41	0	0.2	0	0.2	0	0.2	0	161	1	2	0	20	0	133	1
F14 (0-1) 021318	F14	SO-08	mg/kg	0.4	0	0.84	1	1.8	1	0.2	0	0.2	0	21.9	1	0.2	0	41.5	1	0.2	0	0.4	0	0.2	0	0.2	0	0.2	0	189	1	2	0	20	0	209	1
F15 (0-1) 021318	F15	SO-08	mg/kg	0.088	0	0.55	1	1.3	1	0.044	0	0.058	1	9.38	1	0.044	0	34.4	1	0.044	0	0.1	1	0.044	0	0.082	1	0.044	0	93.4	1	0.44	0	4.4	0	154	1
F16 (0-1) 021318	F16	SO-08	mg/kg	0.088	0	1.7	1	2.1	1	0.044	0	0.044	0	7.33	0	0.044	0	47.6	1	0.044	0	0.088	0	0.044	0	0.047	1	0.044	0	99.5	1	0.44	0	4.4	0	104	1
F17 (0-1) 021318	F17	SO-08	mg/kg	0.22	0	0.33	1	0.62	1	0.11	0	0.11	0	7.8	1	0.11	0	34	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	132	1	1.1	0	11	0	301	1
F18 (0-1) 021418	F18	SO-10	mg/kg	0.048	0	0.048	0	0.048	0	0.024	0	0.024	0	7.48	0	0.024	0	34.2	1	0.024	0	0.048	0	0.024	0	0.024	0	0.024	0	45.2	1	0.24	0	2.4	0	140	1
F19 (0-1) 021418	F19	SO-10	mg/kg	0.084	0	0.084	0	0.3	1	0.042	0	0.042	0	7.43	0	0.042	0	31.2	1	0.042	0	0.084	0	0.042	0	0.042	0	0.042	0	37.1	1	0.42	0	4.2	0	106	1

Attachment C-1a
ProUCL Data Set for Surficial Soil by Shrew Exposure Unit

SID	LOC_ID	EU_SHREW	UOM	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	alpha-BHC	D_alpha-BHC	alpha-Chlordane	D_alpha-Chlordane	Arsenic	D_Arsenic	beta-BHC	D_beta-BHC	Copper	D_Copper	delta-BHC	D_delta-BHC	Dieldrin	D_Dieldrin	gamma-BHC (Lindane)	D_gamma-BHC (Lindane)	gamma-Chlordane	D_gamma-Chlordane	Heptachlor	D_Heptachlor	Lead	D_Lead	Methoxychlor	D_Methoxychlor	Toxaphene	D_Toxaphene	Zinc	D_Zinc
F20 (0-1) 021418	F20	SO-10	mg/kg	0.041	0	0.041	0	0.055	1	0.02	0	0.02	0	7.43	0	0.02	0	52.9	1	0.02	0	0.041	0	0.02	0	0.02	0	0.02	0	80.2	1	0.2	0	2	0	139	1
F21 (0-1) 021418	F21	SO-10	mg/kg	0.087	0	0.087	0	0.087	0	0.044	0	0.044	0	18.8	1	0.044	0	38.2	1	0.044	0	0.087	0	0.044	0	0.044	0	0.044	0	146	1	0.44	0	4.4	0	351	1
F22 (0-1) 021418	F22	SO-13	mg/kg	0.49	0	0.49	0	0.63	1	0.25	0	0.25	0	7.46	0	0.25	0	32	1	0.25	0	0.49	0	0.25	0	0.25	0	0.25	0	189	1	2.5	0	25	0	700	1
F23 (0-1) 021418	F23	SO-13	mg/kg	0.22	0	0.22	0	0.76	1	0.11	0	0.11	0	8.38	1	0.11	0	31.9	1	0.11	0	0.22	0	0.11	0	0.11	0	0.11	0	183	1	1.1	0	11	0	609	1
F24 (0-1) 021418	F24	SO-13	mg/kg	0.044	0	0.069	1	0.14	1	0.022	0	0.022	0	7.4	0	0.022	0	33.8	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	262	1	0.22	0	2.2	0	894	1
F25 (0-1) 021418	F25	SO-13	mg/kg	0.046	0	0.046	0	0.046	0	0.023	0	0.023	0	61.4	1	0.023	0	77	1	0.023	0	0.046	0	0.023	0	0.023	0	0.023	0	2610	1	0.23	0	2.3	0	669	1
F26 (0-1) 021418	F26	SO-16	mg/kg	0.044	0	0.064	1	0.064	1	0.022	0	0.022	0	120	1	0.022	0	48.9	1	0.022	0	0.044	0	0.022	0	0.022	0	0.022	0	5310	1	0.22	0	2.2	0	193	1
F27 (0-1) 021418	F27	SO-16	mg/kg	0.042	0	0.042	0	0.042	0	0.021	0	0.021	0	16.8	1	0.021	0	24.3	1	0.021	0	0.042	0	0.021	0	0.021	0	0.021	0	327	1	0.21	0	2.1	0	364	1
F28 (0-1) 021418	F28	SO-16	mg/kg	0.045	0	0.045	0	0.045	0	0.023	0	0.023	0	60.1	1	0.023	0	43.8	1	0.023	0	0.045	0	0.023	0	0.023	0	0.023	0	1890	1	0.23	0	2.3	0	780	1
F29 (0-1) 021418	F29	SO-16	mg/kg	0.77	1	0.71	1	17	1	0.13	0	0.6	1	19.2	1	0.38	1	48	1	0.13	0	15	1	0.13	0	0.56	1	0.37	1	344	1	1.3	0	13	0	588	1
F3 (0-1) 021318	F3	SO-02	mg/kg	0.25	0	0.3	1	2.6	1	0.12	0	0.12	0	2430	1	0.12	0	514	1	0.12	0	0.35	1	0.12	0	0.12	0	0.12	0	10100	1	1.2	0	12	0	573	1
F30 (0-1) 021418	F30	SO-18	mg/kg	0.0046	0	0.0046	0	0.0046	0	0.0023	0	0.0023	0	7.46	0	0.0023	0	19.9	1	0.0023	0	0.0046	0	0.0023	0	0.0023	0	0.0023	0	46.5	1	0.023	0	0.23	0	97	1
F31 (0-1) 021418	F31	SO-18	mg/kg	4.5	0	0.72	1	82	1	0.022	0	0.078	1	27.6	1	0.46	1	37.2	1	0.022	0	1.1	1	0.022	0	0.22	1	0.17	1	238	1	0.22	0	220	0	147	1
F32 (0-1) 021418	F32	SO-18	mg/kg	0.27	1	0.18	1	6.5	1	0.022	0	0.022	0	13.8	1	0.094	1	39.5	1	0.024	1	0.15	1	0.022	0	0.035	1	0.022	0	136	1	0.22	0	2.2	0	135	1
F4 (0-1) 021318	F4	SO-02	mg/kg	15	1	5.9	1	280	1	1.1	1	0.13	0	295	1	99	1	249	1	1.9	1	0.26	0	0.99	1	0.13	0	0.13	0	2460	1	1.3	0	13	0	405	1
F5 (0-1) 021318	F5	SO-02	mg/kg	0.24	0	0.75	1	1.9	1	0.12	0	0.12	0	158	1	0.29	1	240	1	0.12	0	0.24	0	0.12	0	0.12	0	0.12	0	2330	1	1.2	0	12	0	719	1
F6 (0-1) 021318	F6	SO-04	mg/kg	0.072	1	0.44	1	2.3	1	0.028	1	0.023	0	286	1	0.17	1	549	1	0.023	0	0.18	1	0.023	0	0.023	0	0.023	0	5550	1	0.23	0	2.3	0	717	1
F7 (0-1) 021318	F7	SO-04	mg/kg	0.17	1	2.2	1	5.8	1	0.041	1	0.045	1	345	1	0.13	1	376	1	0.022	0	6.1	1	0.031	1	0.088	1	0.022	0	5840	1	0.22	0	4.3	1	442	1
F8 (0-1) 021318	F8	SO-04	mg/kg	0.043	0	0.17	1	0.41	1	0.022	0	0.022	0	399	1	0.46	1	1010	1	0.022	0	0.043	0	0.022	0	0.022	0	0.022	0	15100	1	0.22	0	2.2	0	1530	1
F9 (0-1) 021318	F9	SO-04	mg/kg	0.085	0	0.41	1	0.83	1	0.043	0	0.043	0	296	1	0.043	0	1270	1	0.043	0	0.085	0	0.043	0	0.043	0	0.043	0	5550	1	0.43	0	4.3	0	1370	1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/31/2018 4:23:48 PM
From File	2018_05_21 Eco SO (2018) ProUCL input (STS-01 to -09) - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	23	Minimum Non-Detect	10.2
Maximum Detect	871	Maximum Non-Detect	10.2
Variance Detects	124156	Percent Non-Detects	12.5%
Mean Detects	264.8	SD Detects	352.4
Median Detects	51.2	CV Detects	1.331
Skewness Detects	1.266	Kurtosis Detects	-0.204
Mean of Logged Detects	4.654	SD of Logged Detects	1.5

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.735	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.315	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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

KM Mean	233	KM Standard Error of Mean	120.9
KM SD	316.6	95% KM (BCA) UCL	445.7
95% KM (t) UCL	462	95% KM (Percentile Bootstrap) UCL	430.1
95% KM (z) UCL	431.8	95% KM Bootstrap t UCL	1393
90% KM Chebyshev UCL	595.6	95% KM Chebyshev UCL	759.9
97.5% KM Chebyshev UCL	987.9	99% KM Chebyshev UCL	1436

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.645	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.3	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.324	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)	0.659	k star (bias corrected MLE)	0.472
Theta hat (MLE)	401.8	Theta star (bias corrected MLE)	561.3
nu hat (MLE)	9.226	nu star (bias corrected)	6.605
Mean (detects)	264.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	231.7
Maximum	871	Median	45.35
SD	339.4	CV	1.465
k hat (MLE)	0.346	k star (bias corrected MLE)	0.299
Theta hat (MLE)	670.2	Theta star (bias corrected MLE)	773.8
nu hat (MLE)	5.532	nu star (bias corrected)	4.791
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.79, α)	1.057	Adjusted Chi Square Value (4.79, β)	0.684
95% Gamma Approximate UCL (use when n>=50)	1050	95% Gamma Adjusted UCL (use when n<50)	1624

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	233	SD (KM)	316.6
Variance (KM)	100206	SE of Mean (KM)	120.9
k hat (KM)	0.542	k star (KM)	0.422
nu hat (KM)	8.666	nu star (KM)	6.75
theta hat (KM)	430.1	theta star (KM)	552.2
80% gamma percentile (KM)	378.1	90% gamma percentile (KM)	651.8
95% gamma percentile (KM)	950.3	99% gamma percentile (KM)	1697

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.75, α)	2.034	Adjusted Chi Square Value (6.75, β)	1.445
95% Gamma Approximate KM-UCL (use when n>=50)	773	95% Gamma Adjusted KM-UCL (use when n<50)	1088

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

5% Lilliefors Critical Value	0.304	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	232	Mean in Log Scale	4.197
SD in Original Scale	339.1	SD in Log Scale	1.898
95% t UCL (assumes normality of ROS data)	459.2	95% Percentile Bootstrap UCL	420.7
95% BCA Bootstrap UCL	497	95% Bootstrap t UCL	1396
95% H-UCL (Log ROS)	26652		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.363	KM Geo Mean	78.46
KM SD (logged)	1.51	95% Critical H Value (KM-Log)	4.769
KM Standard Error of Mean (logged)	0.577	95% H-UCL (KM -Log)	3737
KM SD (logged)	1.51	95% Critical H Value (KM-Log)	4.769
KM Standard Error of Mean (logged)	0.577		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	232.3	Mean in Log Scale	4.276
SD in Original Scale	338.9	SD in Log Scale	1.753
95% t UCL (Assumes normality)	459.3	95% H-Stat UCL	12263

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 Bootstrap t UCL	1393	ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	1088

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.

Arsenic (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	109	Mean	509
Maximum	2430	Median	196
SD	849.1	Std. Error of Mean	320.9
Coefficient of Variation	1.668	Skewness	2.619

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.519	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.457	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	1133	95% Adjusted-CLT UCL (Chen-1995)	1376
		95% Modified-t UCL (Johnson-1978)	1186

Gamma GOF Test

A-D Test Statistic	1.285	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.732	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.396	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.321	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.878	k star (bias corrected MLE)	0.597
Theta hat (MLE)	579.9	Theta star (bias corrected MLE)	852.9
nu hat (MLE)	12.29	nu star (bias corrected)	8.355
MLE Mean (bias corrected)	509	MLE Sd (bias corrected)	658.9
		Approximate Chi Square Value (0.05)	2.942
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	2.063

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1445	95% Adjusted Gamma UCL (use when n<50)	2062

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.742	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.31	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.691	Mean of logged Data	5.564
Maximum of Logged Data	7.796	SD of logged Data	1.032

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	2196	90% Chebyshev (MVUE) UCL	875.2
95% Chebyshev (MVUE) UCL	1089	97.5% Chebyshev (MVUE) UCL	1386
99% Chebyshev (MVUE) UCL	1970		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	1037	95% Jackknife UCL	1133
95% Standard Bootstrap UCL	993.6	95% Bootstrap-t UCL	8112
95% Hall's Bootstrap UCL	4756	95% Percentile Bootstrap UCL	1133
95% BCA Bootstrap UCL	1442		
90% Chebyshev(Mean, Sd) UCL	1472	95% Chebyshev(Mean, Sd) UCL	1908
97.5% Chebyshev(Mean, Sd) UCL	2513	99% Chebyshev(Mean, Sd) UCL	3702

Suggested UCL to Use

95% Hall's Bootstrap UCL 4756

Recommended UCL exceeds the maximum observation

In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL

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.

Arsenic (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	13.4	Mean	90.05
Maximum	232	Median	88.2
SD	75.68	Std. Error of Mean	26.76
Coefficient of Variation	0.84	Skewness	0.869

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	140.7	95% Adjusted-CLT UCL (Chen-1995)	142.9
		95% Modified-t UCL (Johnson-1978)	142.1

Gamma GOF Test

A-D Test Statistic	0.34	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.199	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.3	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.35	k star (bias corrected MLE)	0.927
Theta hat (MLE)	66.71	Theta star (bias corrected MLE)	97.14
nu hat (MLE)	21.6	nu star (bias corrected)	14.83
MLE Mean (bias corrected)	90.05	MLE Sd (bias corrected)	93.53
		Approximate Chi Square Value (0.05)	7.145
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	5.849

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	186.9	95% Adjusted Gamma UCL (use when n<50)	228.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.595	Mean of logged Data	4.086
Maximum of Logged Data	5.447	SD of logged Data	1.067

Assuming Lognormal Distribution

95% H-UCL	447.5	90% Chebyshev (MVUE) UCL	205.9
95% Chebyshev (MVUE) UCL	255.9	97.5% Chebyshev (MVUE) UCL	325.3
99% Chebyshev (MVUE) UCL	461.6		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	134.1	95% Jackknife UCL	140.7
95% Standard Bootstrap UCL	132.5	95% Bootstrap-t UCL	158.3
95% Hall's Bootstrap UCL	168.5	95% Percentile Bootstrap UCL	132.2
95% BCA Bootstrap UCL	139.5		
90% Chebyshev(Mean, Sd) UCL	170.3	95% Chebyshev(Mean, Sd) UCL	206.7
97.5% Chebyshev(Mean, Sd) UCL	257.2	99% Chebyshev(Mean, Sd) UCL	356.3

Suggested UCL to Use

95% Student's-t UCL 140.7

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.

Arsenic (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	115	Mean	310.3
Maximum	573	Median	320.5
SD	148.6	Std. Error of Mean	52.55
Coefficient of Variation	0.479	Skewness	0.266

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.185	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	409.8	95% Adjusted-CLT UCL (Chen-1995)	402
		95% Modified-t UCL (Johnson-1978)	410.6

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.49	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.719	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.25	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.295	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.222	k star (bias corrected MLE)	2.722
Theta hat (MLE)	73.49	Theta star (bias corrected MLE)	114
nu hat (MLE)	67.55	nu star (bias corrected)	43.55
MLE Mean (bias corrected)	310.3	MLE Sd (bias corrected)	188
		Approximate Chi Square Value (0.05)	29.42
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	26.51

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	459.3	95% Adjusted Gamma UCL (use when n<50)	509.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.279	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.745	Mean of logged Data	5.614
Maximum of Logged Data	6.351	SD of logged Data	0.566

Assuming Lognormal Distribution

95% H-UCL	545.7	90% Chebyshev (MVUE) UCL	506
95% Chebyshev (MVUE) UCL	592.6	97.5% Chebyshev (MVUE) UCL	712.8
99% Chebyshev (MVUE) UCL	948.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	396.7	95% Jackknife UCL	409.8
95% Standard Bootstrap UCL	389.4	95% Bootstrap-t UCL	412
95% Hall's Bootstrap UCL	420.8	95% Percentile Bootstrap UCL	394.4
95% BCA Bootstrap UCL	390.5		
90% Chebyshev(Mean, Sd) UCL	467.9	95% Chebyshev(Mean, Sd) UCL	539.3
97.5% Chebyshev(Mean, Sd) UCL	638.4	99% Chebyshev(Mean, Sd) UCL	833.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 409.8

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.

Arsenic (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	6	Number of Non-Detects	5
Number of Distinct Detects	6	Number of Distinct Non-Detects	4
Minimum Detect	11.3	Minimum Non-Detect	7.43
Maximum Detect	125	Maximum Non-Detect	8
Variance Detects	2027	Percent Non-Detects	45.45%
Mean Detects	42.55	SD Detects	45.03
Median Detects	20.75	CV Detects	1.058
Skewness Detects	1.617	Kurtosis Detects	2.05
Mean of Logged Detects	3.334	SD of Logged Detects	0.964

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.77	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.324	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	26.59	KM Standard Error of Mean	11.57
KM SD	35.03	95% KM (BCA) UCL	44.63
95% KM (t) UCL	47.56	95% KM (Percentile Bootstrap) UCL	45.6
95% KM (z) UCL	45.62	95% KM Bootstrap t UCL	119.3
90% KM Chebyshev UCL	61.3	95% KM Chebyshev UCL	77.02
97.5% KM Chebyshev UCL	98.85	99% KM Chebyshev UCL	141.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.505	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.281	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.339	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.341	k star (bias corrected MLE)	0.782
Theta hat (MLE)	31.73	Theta star (bias corrected MLE)	54.44
nu hat (MLE)	16.09	nu star (bias corrected)	9.379
Mean (detects)	42.55		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	23.21
Maximum	125	Median	11.3
SD	38.82	CV	1.672
k hat (MLE)	0.213	k star (bias corrected MLE)	0.216
Theta hat (MLE)	108.9	Theta star (bias corrected MLE)	107.7
nu hat (MLE)	4.688	nu star (bias corrected)	4.743
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (4.74, α)	1.035	Adjusted Chi Square Value (4.74, β)	0.785
95% Gamma Approximate UCL (use when n>=50)	106.4	95% Gamma Adjusted UCL (use when n<50)	140.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	26.59	SD (KM)	35.03
Variance (KM)	1227	SE of Mean (KM)	11.57
k hat (KM)	0.576	k star (KM)	0.479
nu hat (KM)	12.67	nu star (KM)	10.55
theta hat (KM)	46.16	theta star (KM)	55.45
80% gamma percentile (KM)	43.57	90% gamma percentile (KM)	72.55
95% gamma percentile (KM)	103.7	99% gamma percentile (KM)	180.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.55, α)	4.287	Adjusted Chi Square Value (10.55, β)	3.659
95% Gamma Approximate KM-UCL (use when n>=50)	65.41	95% Gamma Adjusted KM-UCL (use when n<50)	76.64

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	24.07	Mean in Log Scale	2.087
SD in Original Scale	38.27	SD in Log Scale	1.601
95% t UCL (assumes normality of ROS data)	44.98	95% Percentile Bootstrap UCL	43.63
95% BCA Bootstrap UCL	53.43	95% Bootstrap t UCL	100.8
95% H-UCL (Log ROS)	250.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.73	KM Geo Mean	15.33
KM SD (logged)	0.927	95% Critical H Value (KM-Log)	2.86
KM Standard Error of Mean (logged)	0.306	95% H-UCL (KM -Log)	54.52
KM SD (logged)	0.927	95% Critical H Value (KM-Log)	2.86
KM Standard Error of Mean (logged)	0.306		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	24.93	Mean in Log Scale	2.422
SD in Original Scale	37.73	SD in Log Scale	1.25
95% t UCL (Assumes normality)	45.55	95% H-Stat UCL	98.09

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	47.56

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	8.09	Mean	206
Maximum	495	Median	215
SD	172.7	Std. Error of Mean	61.06
Coefficient of Variation	0.838	Skewness	0.37

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	321.7	95% Adjusted-CLT UCL (Chen-1995)	315
		95% Modified-t UCL (Johnson-1978)	323.1

Gamma GOF Test

A-D Test Statistic	0.432	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.213	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.302	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.963	k star (bias corrected MLE)	0.685
Theta hat (MLE)	213.9	Theta star (bias corrected MLE)	300.6
nu hat (MLE)	15.41	nu star (bias corrected)	10.97
MLE Mean (bias corrected)	206	MLE Sd (bias corrected)	248.9
		Approximate Chi Square Value (0.05)	4.554
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	3.568

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	496.1	95% Adjusted Gamma UCL (use when n<50)	633.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.091	Mean of logged Data	4.726
Maximum of Logged Data	6.205	SD of logged Data	1.44

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	3845	90% Chebyshev (MVUE) UCL	659.3
95% Chebyshev (MVUE) UCL	840.5	97.5% Chebyshev (MVUE) UCL	1092
99% Chebyshev (MVUE) UCL	1586		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	306.5	95% Jackknife UCL	321.7
95% Standard Bootstrap UCL	298.1	95% Bootstrap-t UCL	327.3
95% Hall's Bootstrap UCL	307.7	95% Percentile Bootstrap UCL	300.5
95% BCA Bootstrap UCL	301.1		
90% Chebyshev(Mean, Sd) UCL	389.2	95% Chebyshev(Mean, Sd) UCL	472.2
97.5% Chebyshev(Mean, Sd) UCL	587.4	99% Chebyshev(Mean, Sd) UCL	813.6

Suggested UCL to Use

95% Student's-t UCL 321.7

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.

Arsenic (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	34.6	Minimum Non-Detect	7.39
Maximum Detect	84.6	Maximum Non-Detect	7.46
Variance Detects	399	Percent Non-Detects	25%
Mean Detects	53.7	SD Detects	19.97
Median Detects	51.1	CV Detects	0.372
Skewness Detects	0.621	Kurtosis Detects	-0.974
Mean of Logged Detects	3.927	SD of Logged Detects	0.368

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.895	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	42.12	KM Standard Error of Mean	9.885
KM SD	25.52	95% KM (BCA) UCL	55.5
95% KM (t) UCL	60.85	95% KM (Percentile Bootstrap) UCL	57.21
95% KM (z) UCL	58.38	95% KM Bootstrap t UCL	58.75
90% KM Chebyshev UCL	71.78	95% KM Chebyshev UCL	85.21
97.5% KM Chebyshev UCL	103.9	99% KM Chebyshev UCL	140.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.39	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.241	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.333	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)	8.965	k star (bias corrected MLE)	4.594
Theta hat (MLE)	5.99	Theta star (bias corrected MLE)	11.69
nu hat (MLE)	107.6	nu star (bias corrected)	55.12
Mean (detects)	53.7		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	10.89	Mean	43
Maximum	84.6	Median	38.35
SD	26.03	CV	0.605
k hat (MLE)	2.434	k star (bias corrected MLE)	1.605
Theta hat (MLE)	17.66	Theta star (bias corrected MLE)	26.79
nu hat (MLE)	38.95	nu star (bias corrected)	25.68
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (25.68, α)	15.13	Adjusted Chi Square Value (25.68, β)	13.13
95% Gamma Approximate UCL (use when n>=50)	72.97	95% Gamma Adjusted UCL (use when n<50)	84.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	42.12	SD (KM)	25.52
Variance (KM)	651.5	SE of Mean (KM)	9.885
k hat (KM)	2.723	k star (KM)	1.786
nu hat (KM)	43.58	nu star (KM)	28.57
theta hat (KM)	15.47	theta star (KM)	23.59
80% gamma percentile (KM)	63.9	90% gamma percentile (KM)	84.16
95% gamma percentile (KM)	103.6	99% gamma percentile (KM)	147

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.57, α)	17.37	Adjusted Chi Square Value (28.57, β)	15.2
95% Gamma Approximate KM-UCL (use when n>=50)	69.27	95% Gamma Adjusted KM-UCL (use when n<50)	79.14

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	45.31	Mean in Log Scale	3.696
SD in Original Scale	22.94	SD in Log Scale	0.529
95% t UCL (assumes normality of ROS data)	60.68	95% Percentile Bootstrap UCL	57.59
95% BCA Bootstrap UCL	59.01	95% Bootstrap t UCL	64.7
95% H-UCL (Log ROS)	74.87		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.445	KM Geo Mean	31.34
KM SD (logged)	0.883	95% Critical H Value (KM-Log)	3.144
KM Standard Error of Mean (logged)	0.342	95% H-UCL (KM -Log)	132.3
KM SD (logged)	0.883	95% Critical H Value (KM-Log)	3.144
KM Standard Error of Mean (logged)	0.342		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	41.2	Mean in Log Scale	3.273
SD in Original Scale	28.64	SD in Log Scale	1.25
95% t UCL (Assumes normality)	60.39	95% H-Stat UCL	393.5

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	60.85

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

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.

Arsenic (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	7.8	Minimum Non-Detect	7.33
Maximum Detect	122	Maximum Non-Detect	7.33
Variance Detects	1794	Percent Non-Detects	12.5%
Mean Detects	37.48	SD Detects	42.36
Median Detects	21.9	CV Detects	1.13
Skewness Detects	1.706	Kurtosis Detects	2.382
Mean of Logged Detects	3.14	SD of Logged Detects	1.029

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.754	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.345	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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

KM Mean	33.71	KM Standard Error of Mean	14.52
KM SD	38.01	95% KM (BCA) UCL	56.58
95% KM (t) UCL	61.22	95% KM (Percentile Bootstrap) UCL	59.04
95% KM (z) UCL	57.59	95% KM Bootstrap t UCL	151.2
90% KM Chebyshev UCL	77.26	95% KM Chebyshev UCL	96.99
97.5% KM Chebyshev UCL	124.4	99% KM Chebyshev UCL	178.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.504	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.276	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.319	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.171	k star (bias corrected MLE)	0.765
Theta hat (MLE)	32	Theta star (bias corrected MLE)	49.02
nu hat (MLE)	16.4	nu star (bias corrected)	10.7
Mean (detects)	37.48		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	32.8
Maximum	122	Median	16.75
SD	41.39	CV	1.262
k hat (MLE)	0.484	k star (bias corrected MLE)	0.386
Theta hat (MLE)	67.75	Theta star (bias corrected MLE)	85
nu hat (MLE)	7.745	nu star (bias corrected)	6.174
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.17, α)	1.73	Adjusted Chi Square Value (6.17, β)	1.202
95% Gamma Approximate UCL (use when n>=50)	117.1	95% Gamma Adjusted UCL (use when n<50)	168.5

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	33.71	SD (KM)	38.01
Variance (KM)	1445	SE of Mean (KM)	14.52
k hat (KM)	0.787	k star (KM)	0.575
nu hat (KM)	12.59	nu star (KM)	9.199
theta hat (KM)	42.86	theta star (KM)	58.64
80% gamma percentile (KM)	55.56	90% gamma percentile (KM)	88.52
95% gamma percentile (KM)	123.2	99% gamma percentile (KM)	207.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.20, α)	3.448	Adjusted Chi Square Value (9.20, β)	2.619
95% Gamma Approximate KM-UCL (use when n>=50)	89.95	95% Gamma Adjusted KM-UCL (use when n<50)	118.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.211	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	33.02	Mean in Log Scale	2.821
SD in Original Scale	41.19	SD in Log Scale	1.312
95% t UCL (assumes normality of ROS data)	60.62	95% Percentile Bootstrap UCL	57.46
95% BCA Bootstrap UCL	66.11	95% Bootstrap t UCL	136.6
95% H-UCL (Log ROS)	323.8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.996	KM Geo Mean	20.01
KM SD (logged)	0.969	95% Critical H Value (KM-Log)	3.349
KM Standard Error of Mean (logged)	0.37	95% H-UCL (KM -Log)	109
KM SD (logged)	0.969	95% Critical H Value (KM-Log)	3.349
KM Standard Error of Mean (logged)	0.37		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	33.26	Mean in Log Scale	2.91
SD in Original Scale	41	SD in Log Scale	1.154
95% t UCL (Assumes normality)	60.72	95% H-Stat UCL	188.4

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 Bootstrap t UCL	151.2	ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	118.4

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.

Arsenic (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	36.5	Minimum Non-Detect	7.4
Maximum Detect	312	Maximum Non-Detect	7.47
Variance Detects	10775	Percent Non-Detects	25%
Mean Detects	127	SD Detects	103.8
Median Detects	97.75	CV Detects	0.817
Skewness Detects	1.351	Kurtosis Detects	1.582
Mean of Logged Detects	4.568	SD of Logged Detects	0.823

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.251	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	97.09	KM Standard Error of Mean	37.58
KM SD	97.03	95% KM (BCA) UCL	158.5
95% KM (t) UCL	168.3	95% KM (Percentile Bootstrap) UCL	160.4
95% KM (z) UCL	158.9	95% KM Bootstrap t UCL	218.1
90% KM Chebyshev UCL	209.8	95% KM Chebyshev UCL	260.9
97.5% KM Chebyshev UCL	331.8	99% KM Chebyshev UCL	471

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.261	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.188	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.336	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)	1.959	k star (bias corrected MLE)	1.09
Theta hat (MLE)	64.83	Theta star (bias corrected MLE)	116.5
nu hat (MLE)	23.5	nu star (bias corrected)	13.09
Mean (detects)	127		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	95.24
Maximum	312	Median	66.2
SD	105.6	CV	1.109
k hat (MLE)	0.302	k star (bias corrected MLE)	0.272
Theta hat (MLE)	315.5	Theta star (bias corrected MLE)	350.1
nu hat (MLE)	4.83	nu star (bias corrected)	4.352

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.35, α)	0.865	Adjusted Chi Square Value (4.35, β)	0.544
95% Gamma Approximate UCL (use when n>=50)	478.9	95% Gamma Adjusted UCL (use when n<50)	762.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	97.09	SD (KM)	97.03
Variance (KM)	9416	SE of Mean (KM)	37.58
k hat (KM)	1.001	k star (KM)	0.709
nu hat (KM)	16.02	nu star (KM)	11.34
theta hat (KM)	96.98	theta star (KM)	136.9
80% gamma percentile (KM)	159.5	90% gamma percentile (KM)	243
95% gamma percentile (KM)	328.9	99% gamma percentile (KM)	533.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.34, α)	4.798	Adjusted Chi Square Value (11.34, β)	3.78
95% Gamma Approximate KM-UCL (use when n>=50)	229.5	95% Gamma Adjusted KM-UCL (use when n<50)	291.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	98.19	Mean in Log Scale	4.043
SD in Original Scale	102.7	SD in Log Scale	1.195
95% t UCL (assumes normality of ROS data)	167	95% Percentile Bootstrap UCL	157.8
95% BCA Bootstrap UCL	168.5	95% Bootstrap t UCL	226
95% H-UCL (Log ROS)	684.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.926	KM Geo Mean	50.71
KM SD (logged)	1.288	95% Critical H Value (KM-Log)	4.168
KM Standard Error of Mean (logged)	0.499	95% H-UCL (KM -Log)	883.6
KM SD (logged)	1.288	95% Critical H Value (KM-Log)	4.168
KM Standard Error of Mean (logged)	0.499		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	96.17	Mean in Log Scale	3.754
SD in Original Scale	104.7	SD in Log Scale	1.66
95% t UCL (Assumes normality)	166.3	95% H-Stat UCL	4359

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 168.3

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 (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	52.3	Mean	476.3
Maximum	1790	Median	154
SD	658.9	Std. Error of Mean	233
Coefficient of Variation	1.383	Skewness	1.633

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.663	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.422	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	917.6	95% Adjusted-CLT UCL (Chen-1995)	1003
		95% Modified-t UCL (Johnson-1978)	940.1

Gamma GOF Test

A-D Test Statistic	1.02	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.384	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.304	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	0.8	k star (bias corrected MLE)	0.583
Theta hat (MLE)	595.4	Theta star (bias corrected MLE)	816.6
nu hat (MLE)	12.8	nu star (bias corrected)	9.332
MLE Mean (bias corrected)	476.3	MLE Sd (bias corrected)	623.6
		Approximate Chi Square Value (0.05)	3.529
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.688

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1260	95% Adjusted Gamma UCL (use when n<50)	1654

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.319	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data Not Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.957	Mean of logged Data	5.424
Maximum of Logged Data	7.49	SD of logged Data	1.226

Assuming Lognormal Distribution

95% H-UCL	3080	90% Chebyshev (MVUE) UCL	976.6
95% Chebyshev (MVUE) UCL	1229	97.5% Chebyshev (MVUE) UCL	1579
99% Chebyshev (MVUE) UCL	2266		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	859.5	95% Jackknife UCL	917.6
95% Standard Bootstrap UCL	827.9	95% Bootstrap-t UCL	5988
95% Hall's Bootstrap UCL	6288	95% Percentile Bootstrap UCL	880.8
95% BCA Bootstrap UCL	964.8		
90% Chebyshev(Mean, Sd) UCL	1175	95% Chebyshev(Mean, Sd) UCL	1492
97.5% Chebyshev(Mean, Sd) UCL	1931	99% Chebyshev(Mean, Sd) UCL	2794

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1492

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Copper (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	240	Mean	315.4
Maximum	514	Median	270
SD	100.1	Std. Error of Mean	37.85
Coefficient of Variation	0.317	Skewness	1.627

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.791	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.256	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	389	95% Adjusted-CLT UCL (Chen-1995)	402.6
		95% Modified-t UCL (Johnson-1978)	392.8

Gamma GOF Test

A-D Test Statistic	0.621	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.253	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.312	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.79	k star (bias corrected MLE)	7.976
Theta hat (MLE)	22.87	Theta star (bias corrected MLE)	39.55
nu hat (MLE)	193.1	nu star (bias corrected)	111.7
MLE Mean (bias corrected)	315.4	MLE Sd (bias corrected)	111.7
		Approximate Chi Square Value (0.05)	88.27
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	82

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	399	95% Adjusted Gamma UCL (use when n<50)	429.5

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.84	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.235	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.481	Mean of logged Data	5.717
Maximum of Logged Data	6.242	SD of logged Data	0.281

Assuming Lognormal Distribution

95% H-UCL	405.4	90% Chebyshev (MVUE) UCL	414.9
95% Chebyshev (MVUE) UCL	460.3	97.5% Chebyshev (MVUE) UCL	523.4
99% Chebyshev (MVUE) UCL	647.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	377.7	95% Jackknife UCL	389
95% Standard Bootstrap UCL	374.4	95% Bootstrap-t UCL	551.9
95% Hall's Bootstrap UCL	665.1	95% Percentile Bootstrap UCL	380.1
95% BCA Bootstrap UCL	398		
90% Chebyshev(Mean, Sd) UCL	429	95% Chebyshev(Mean, Sd) UCL	480.4
97.5% Chebyshev(Mean, Sd) UCL	551.8	99% Chebyshev(Mean, Sd) UCL	692

Suggested UCL to Use

95% Student's-t UCL 389

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Copper (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	39.9	Mean	253.7
Maximum	784	Median	236
SD	241.1	Std. Error of Mean	85.23
Coefficient of Variation	0.95	Skewness	1.715

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.814	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	415.1	95% Adjusted-CLT UCL (Chen-1995)	449.1
		95% Modified-t UCL (Johnson-1978)	423.8

Gamma GOF Test

A-D Test Statistic	0.34	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.185	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.3	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.343	k star (bias corrected MLE)	0.923
Theta hat (MLE)	188.9	Theta star (bias corrected MLE)	274.9
nu hat (MLE)	21.49	nu star (bias corrected)	14.76
MLE Mean (bias corrected)	253.7	MLE Sd (bias corrected)	264.1
		Approximate Chi Square Value (0.05)	7.098
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	5.807

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	527.7	95% Adjusted Gamma UCL (use when n<50)	644.9

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.236	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.686	Mean of logged Data	5.12
Maximum of Logged Data	6.664	SD of logged Data	1.032

Assuming Lognormal Distribution

95% H-UCL	1119	90% Chebyshev (MVUE) UCL	552.6
95% Chebyshev (MVUE) UCL	684.7	97.5% Chebyshev (MVUE) UCL	868
99% Chebyshev (MVUE) UCL	1228		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	393.9	95% Jackknife UCL	415.1
95% Standard Bootstrap UCL	384.9	95% Bootstrap-t UCL	510.8
95% Hall's Bootstrap UCL	1033	95% Percentile Bootstrap UCL	396.5
95% BCA Bootstrap UCL	435.7		
90% Chebyshev(Mean, Sd) UCL	509.4	95% Chebyshev(Mean, Sd) UCL	625.2
97.5% Chebyshev(Mean, Sd) UCL	785.9	99% Chebyshev(Mean, Sd) UCL	1102

Suggested UCL to Use

95% Student's-t UCL 415.1

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Copper (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	80.4	Mean	576.8
Maximum	1270	Median	513.5
SD	399.6	Std. Error of Mean	141.3
Coefficient of Variation	0.693	Skewness	0.68

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.171	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	844.4	95% Adjusted-CLT UCL (Chen-1995)	845.5
		95% Modified-t UCL (Johnson-1978)	850.1

Gamma GOF Test

A-D Test Statistic	0.173	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.13	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.934	k star (bias corrected MLE)	1.292
Theta hat (MLE)	298.2	Theta star (bias corrected MLE)	446.4
nu hat (MLE)	30.95	nu star (bias corrected)	20.67
MLE Mean (bias corrected)	576.8	MLE Sd (bias corrected)	507.4
		Approximate Chi Square Value (0.05)	11.35
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	9.651

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1051	95% Adjusted Gamma UCL (use when n<50)	1236

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.387	Mean of logged Data	6.077
Maximum of Logged Data	7.147	SD of logged Data	0.895

Assuming Lognormal Distribution

95% H-UCL	1901	90% Chebyshev (MVUE) UCL	1203
95% Chebyshev (MVUE) UCL	1470	97.5% Chebyshev (MVUE) UCL	1842
99% Chebyshev (MVUE) UCL	2573		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	809.2	95% Jackknife UCL	844.4
95% Standard Bootstrap UCL	789.8	95% Bootstrap-t UCL	949.1
95% Hall's Bootstrap UCL	1103	95% Percentile Bootstrap UCL	806.4
95% BCA Bootstrap UCL	815.6		
90% Chebyshev(Mean, Sd) UCL	1001	95% Chebyshev(Mean, Sd) UCL	1193
97.5% Chebyshev(Mean, Sd) UCL	1459	99% Chebyshev(Mean, Sd) UCL	1982

Suggested UCL to Use

95% Student's-t UCL 844.4

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 (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	13.3	Mean	92.8
Maximum	457	Median	27.1
SD	151.3	Std. Error of Mean	45.62
Coefficient of Variation	1.63	Skewness	2.054

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.583	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.419	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	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	175.5	95% Adjusted-CLT UCL (Chen-1995)	198
		95% Modified-t UCL (Johnson-1978)	180.2

Gamma GOF Test

A-D Test Statistic	1.502	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.767	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.317	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.266	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.696	k star (bias corrected MLE)	0.567
Theta hat (MLE)	133.3	Theta star (bias corrected MLE)	163.7
nu hat (MLE)	15.32	nu star (bias corrected)	12.48
MLE Mean (bias corrected)	92.8	MLE Sd (bias corrected)	123.2
		Approximate Chi Square Value (0.05)	5.542
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	4.81

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	208.9	95% Adjusted Gamma UCL (use when n<50)	240.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.794	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.212	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.588	Mean of logged Data	3.662
Maximum of Logged Data	6.125	SD of logged Data	1.222

Assuming Lognormal Distribution

95% H-UCL	310.9	90% Chebyshev (MVUE) UCL	162.1
95% Chebyshev (MVUE) UCL	202	97.5% Chebyshev (MVUE) UCL	257.2
99% Chebyshev (MVUE) UCL	365.8		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	167.8	95% Jackknife UCL	175.5
95% Standard Bootstrap UCL	164.5	95% Bootstrap-t UCL	859.9
95% Hall's Bootstrap UCL	669.1	95% Percentile Bootstrap UCL	169.8
95% BCA Bootstrap UCL	193		
90% Chebyshev(Mean, Sd) UCL	229.7	95% Chebyshev(Mean, Sd) UCL	291.7
97.5% Chebyshev(Mean, Sd) UCL	377.7	99% Chebyshev(Mean, Sd) UCL	546.7

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 291.7

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 (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	35.4	Mean	526.1
Maximum	2360	Median	248.5
SD	768.1	Std. Error of Mean	271.6
Coefficient of Variation	1.46	Skewness	2.462

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.654	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.313	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	1041	95% Adjusted-CLT UCL (Chen-1995)	1225
		95% Modified-t UCL (Johnson-1978)	1080

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.346	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.196	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.799	k star (bias corrected MLE)	0.583
Theta hat (MLE)	658	Theta star (bias corrected MLE)	902.3
nu hat (MLE)	12.79	nu star (bias corrected)	9.328
MLE Mean (bias corrected)	526.1	MLE Sd (bias corrected)	689
		Approximate Chi Square Value (0.05)	3.526
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.685

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1392	95% Adjusted Gamma UCL (use when n<50)	1827

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.987	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.117	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.567	Mean of logged Data	5.523
Maximum of Logged Data	7.766	SD of logged Data	1.311

Assuming Lognormal Distribution

95% H-UCL	4807	90% Chebyshev (MVUE) UCL	1215
95% Chebyshev (MVUE) UCL	1537	97.5% Chebyshev (MVUE) UCL	1984
99% Chebyshev (MVUE) UCL	2862		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	972.8	95% Jackknife UCL	1041
95% Standard Bootstrap UCL	947.7	95% Bootstrap-t UCL	2407
95% Hall's Bootstrap UCL	2763	95% Percentile Bootstrap UCL	1034
95% BCA Bootstrap UCL	1178		
90% Chebyshev(Mean, Sd) UCL	1341	95% Chebyshev(Mean, Sd) UCL	1710
97.5% Chebyshev(Mean, Sd) UCL	2222	99% Chebyshev(Mean, Sd) UCL	3228

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Adjusted Gamma UCL 1827

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 (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	25.1	Mean	111.3
Maximum	283	Median	86.05
SD	96.75	Std. Error of Mean	34.21
Coefficient of Variation	0.87	Skewness	1.195

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.809	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	176.1	95% Adjusted-CLT UCL (Chen-1995)	183
		95% Modified-t UCL (Johnson-1978)	178.5

Gamma GOF Test

A-D Test Statistic	0.419	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.228	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	1.67	k star (bias corrected MLE)	1.127
Theta hat (MLE)	66.62	Theta star (bias corrected MLE)	98.71
nu hat (MLE)	26.72	nu star (bias corrected)	18.03
MLE Mean (bias corrected)	111.3	MLE Sd (bias corrected)	104.8
		Approximate Chi Square Value (0.05)	9.414
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	7.89

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	213.1	95% Adjusted Gamma UCL (use when n<50)	254.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.176	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.223	Mean of logged Data	4.383
Maximum of Logged Data	5.645	SD of logged Data	0.874

Assuming Lognormal Distribution

95% H-UCL	328.8	90% Chebyshev (MVUE) UCL	215.1
95% Chebyshev (MVUE) UCL	262.4	97.5% Chebyshev (MVUE) UCL	328.1
99% Chebyshev (MVUE) UCL	457.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	167.5	95% Jackknife UCL	176.1
95% Standard Bootstrap UCL	162.8	95% Bootstrap-t UCL	283
95% Hall's Bootstrap UCL	607.2	95% Percentile Bootstrap UCL	168.2
95% BCA Bootstrap UCL	178.1		
90% Chebyshev(Mean, Sd) UCL	213.9	95% Chebyshev(Mean, Sd) UCL	260.3
97.5% Chebyshev(Mean, Sd) UCL	324.9	99% Chebyshev(Mean, Sd) UCL	451.6

Suggested UCL to Use

95% Adjusted Gamma UCL 254.3

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Copper (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	34	Mean	223.5
Maximum	907	Median	72.65
SD	305.7	Std. Error of Mean	108.1
Coefficient of Variation	1.367	Skewness	1.993

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.708	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	428.3	95% Adjusted-CLT UCL (Chen-1995)	482.7
		95% Modified-t UCL (Johnson-1978)	441

Gamma GOF Test

A-D Test Statistic	0.63	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.261	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.303	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.811	k star (bias corrected MLE)	0.59
Theta hat (MLE)	275.5	Theta star (bias corrected MLE)	378.6
nu hat (MLE)	12.98	nu star (bias corrected)	9.446
MLE Mean (bias corrected)	223.5	MLE Sd (bias corrected)	290.9
		Approximate Chi Square Value (0.05)	3.598
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.747

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	586.7	95% Adjusted Gamma UCL (use when n<50)	768.7

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.871	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.526	Mean of logged Data	4.679
Maximum of Logged Data	6.81	SD of logged Data	1.255

Assuming Lognormal Distribution

95% H-UCL	1642	90% Chebyshev (MVUE) UCL	482.8
95% Chebyshev (MVUE) UCL	608.7	97.5% Chebyshev (MVUE) UCL	783.3
99% Chebyshev (MVUE) UCL	1126		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	401.3	95% Jackknife UCL	428.3
95% Standard Bootstrap UCL	396.5	95% Bootstrap-t UCL	965.8
95% Hall's Bootstrap UCL	1080	95% Percentile Bootstrap UCL	394.7
95% BCA Bootstrap UCL	467		
90% Chebyshev(Mean, Sd) UCL	547.7	95% Chebyshev(Mean, Sd) UCL	694.6
97.5% Chebyshev(Mean, Sd) UCL	898.4	99% Chebyshev(Mean, Sd) UCL	1299

Suggested UCL to Use

95% Adjusted Gamma UCL 768.7

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 (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	6.98	Mean	239.6
Maximum	526	Median	147
SD	215.5	Std. Error of Mean	76.18
Coefficient of Variation	0.899	Skewness	0.447

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data Not 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	383.9	95% Adjusted-CLT UCL (Chen-1995)	377.8
		95% Modified-t UCL (Johnson-1978)	385.9

Gamma GOF Test

A-D Test Statistic	0.426	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.222	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.303	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.872	k star (bias corrected MLE)	0.628
Theta hat (MLE)	274.8	Theta star (bias corrected MLE)	381.3
nu hat (MLE)	13.95	nu star (bias corrected)	10.05
MLE Mean (bias corrected)	239.6	MLE Sd (bias corrected)	302.3
		Approximate Chi Square Value (0.05)	3.975
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	3.068

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	605.9	95% Adjusted Gamma UCL (use when n<50)	785

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.943	Mean of logged Data	4.806
Maximum of Logged Data	6.265	SD of logged Data	1.547

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	6985	90% Chebyshev (MVUE) UCL	835.8
95% Chebyshev (MVUE) UCL	1071	97.5% Chebyshev (MVUE) UCL	1398
99% Chebyshev (MVUE) UCL	2040		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	364.9	95% Jackknife UCL	383.9
95% Standard Bootstrap UCL	359.2	95% Bootstrap-t UCL	397.8
95% Hall's Bootstrap UCL	331.6	95% Percentile Bootstrap UCL	354.6
95% BCA Bootstrap UCL	368.8		
90% Chebyshev(Mean, Sd) UCL	468.1	95% Chebyshev(Mean, Sd) UCL	571.6
97.5% Chebyshev(Mean, Sd) UCL	715.3	99% Chebyshev(Mean, Sd) UCL	997.6

Suggested UCL to Use

95% Student's-t UCL 383.9

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Lead (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	59.1	Mean	2222
Maximum	7990	Median	516
SD	3298	Std. Error of Mean	1166
Coefficient of Variation	1.484	Skewness	1.438

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.653	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.399	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	4431	95% Adjusted-CLT UCL (Chen-1995)	4774
		95% Modified-t UCL (Johnson-1978)	4530

Gamma GOF Test

A-D Test Statistic	0.74	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.758	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.287	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.308	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.568	k star (bias corrected MLE)	0.438
Theta hat (MLE)	3915	Theta star (bias corrected MLE)	5072
nu hat (MLE)	9.083	nu star (bias corrected)	7.01
MLE Mean (bias corrected)	2222	MLE Sd (bias corrected)	3357
		Approximate Chi Square Value (0.05)	2.176
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	1.56

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	7159	95% Adjusted Gamma UCL (use when n<50)	9984

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.197	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.079	Mean of logged Data	6.609
Maximum of Logged Data	8.986	SD of logged Data	1.64

Assuming Lognormal Distribution

95% H-UCL	68202	90% Chebyshev (MVUE) UCL	5823
95% Chebyshev (MVUE) UCL	7496	97.5% Chebyshev (MVUE) UCL	9818
99% Chebyshev (MVUE) UCL	14378		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4140	95% Jackknife UCL	4431
95% Standard Bootstrap UCL	4007	95% Bootstrap-t UCL	24286
95% Hall's Bootstrap UCL	20597	95% Percentile Bootstrap UCL	4061
95% BCA Bootstrap UCL	4787		
90% Chebyshev(Mean, Sd) UCL	5720	95% Chebyshev(Mean, Sd) UCL	7305
97.5% Chebyshev(Mean, Sd) UCL	9504	99% Chebyshev(Mean, Sd) UCL	13824

Suggested UCL to Use

95% Adjusted Gamma UCL 9984

Recommended UCL exceeds the maximum observation

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.

Lead (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	1190	Mean	3146
Maximum	10100	Median	2330
SD	3109	Std. Error of Mean	1175
Coefficient of Variation	0.988	Skewness	2.492

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.607	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.444	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5429	95% Adjusted-CLT UCL (Chen-1995)	6261
		95% Modified-t UCL (Johnson-1978)	5614

Gamma GOF Test

A-D Test Statistic	0.937	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.715	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.398	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.315	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.068	k star (bias corrected MLE)	1.277
Theta hat (MLE)	1521	Theta star (bias corrected MLE)	2463
nu hat (MLE)	28.96	nu star (bias corrected)	17.88
MLE Mean (bias corrected)	3146	MLE Sd (bias corrected)	2784
		Approximate Chi Square Value (0.05)	9.305
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	7.512

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	6045	95% Adjusted Gamma UCL (use when n<50)	7487

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.349	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	7.082	Mean of logged Data	7.793
Maximum of Logged Data	9.22	SD of logged Data	0.693

Assuming Lognormal Distribution

95% H-UCL	6977	90% Chebyshev (MVUE) UCL	5307
95% Chebyshev (MVUE) UCL	6369	97.5% Chebyshev (MVUE) UCL	7843
99% Chebyshev (MVUE) UCL	10737		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	5079	95% Jackknife UCL	5429
95% Standard Bootstrap UCL	4928	95% Bootstrap-t UCL	11649
95% Hall's Bootstrap UCL	16870	95% Percentile Bootstrap UCL	5380
95% BCA Bootstrap UCL	5613		
90% Chebyshev(Mean, Sd) UCL	6671	95% Chebyshev(Mean, Sd) UCL	8268
97.5% Chebyshev(Mean, Sd) UCL	10485	99% Chebyshev(Mean, Sd) UCL	14839

Suggested UCL to Use

95% H-UCL 6977

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.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Lead (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	107	Mean	6544
Maximum	45100	Median	1124
SD	15605	Std. Error of Mean	5517
Coefficient of Variation	2.385	Skewness	2.81

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.47	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.475	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16996	95% Adjusted-CLT UCL (Chen-1995)	21475
		95% Modified-t UCL (Johnson-1978)	17910

Gamma GOF Test

A-D Test Statistic	0.905	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.786	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.338	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.314	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.362	k star (bias corrected MLE)	0.309
Theta hat (MLE)	18084	Theta star (bias corrected MLE)	21143
nu hat (MLE)	5.79	nu star (bias corrected)	4.952
MLE Mean (bias corrected)	6544	MLE Sd (bias corrected)	11763
		Approximate Chi Square Value (0.05)	1.13
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.738

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	28676	95% Adjusted Gamma UCL (use when n<50)	43894

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.189	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.673	Mean of logged Data	6.938
Maximum of Logged Data	10.72	SD of logged Data	1.916

Assuming Lognormal Distribution

95% H-UCL	463153	90% Chebyshev (MVUE) UCL	12370
95% Chebyshev (MVUE) UCL	16088	97.5% Chebyshev (MVUE) UCL	21248
99% Chebyshev (MVUE) UCL	31383		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	15619	95% Jackknife UCL	16996
95% Standard Bootstrap UCL	15186	95% Bootstrap-t UCL	142507
95% Hall's Bootstrap UCL	80934	95% Percentile Bootstrap UCL	17369
95% BCA Bootstrap UCL	23096		
90% Chebyshev(Mean, Sd) UCL	23095	95% Chebyshev(Mean, Sd) UCL	30592
97.5% Chebyshev(Mean, Sd) UCL	40998	99% Chebyshev(Mean, Sd) UCL	61438

Suggested UCL to Use

99% Chebyshev (Mean, Sd) UCL 61438

Recommended UCL exceeds the maximum observation

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.

Lead (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	1230	Mean	5790
Maximum	15100	Median	5550
SD	4543	Std. Error of Mean	1606
Coefficient of Variation	0.785	Skewness	1.295

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.874	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	8833	95% Adjusted-CLT UCL (Chen-1995)	9217
		95% Modified-t UCL (Johnson-1978)	8955

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.287	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.887	k star (bias corrected MLE)	1.263
Theta hat (MLE)	3068	Theta star (bias corrected MLE)	4585
nu hat (MLE)	30.19	nu star (bias corrected)	20.2
MLE Mean (bias corrected)	5790	MLE Sd (bias corrected)	5153
		Approximate Chi Square Value (0.05)	11
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	9.332

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	10633	95% Adjusted Gamma UCL (use when n<50)	12535

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.239	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	7.115	Mean of logged Data	8.376
Maximum of Logged Data	9.622	SD of logged Data	0.847

Assuming Lognormal Distribution

95% H-UCL	16561	90% Chebyshev (MVUE) UCL	11275
95% Chebyshev (MVUE) UCL	13717	97.5% Chebyshev (MVUE) UCL	17106
99% Chebyshev (MVUE) UCL	23764		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	8432	95% Jackknife UCL	8833
95% Standard Bootstrap UCL	8230	95% Bootstrap-t UCL	10321
95% Hall's Bootstrap UCL	23169	95% Percentile Bootstrap UCL	8378
95% BCA Bootstrap UCL	8826		
90% Chebyshev(Mean, Sd) UCL	10608	95% Chebyshev(Mean, Sd) UCL	12791
97.5% Chebyshev(Mean, Sd) UCL	15820	99% Chebyshev(Mean, Sd) UCL	21771

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 8833

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.

Lead (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	37.9	Mean	330
Maximum	1720	Median	69.2
SD	557.1	Std. Error of Mean	168
Coefficient of Variation	1.688	Skewness	2.126

Normal GOF Test

Shapiro Wilk Test Statistic	0.596	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.397	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	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	634.5	95% Adjusted-CLT UCL (Chen-1995)	721.4
		95% Modified-t UCL (Johnson-1978)	652.4

Gamma GOF Test

A-D Test Statistic	1.35	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.772	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.332	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.267	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.617	k star (bias corrected MLE)	0.509
Theta hat (MLE)	534.9	Theta star (bias corrected MLE)	647.9
nu hat (MLE)	13.57	nu star (bias corrected)	11.21
MLE Mean (bias corrected)	330	MLE Sd (bias corrected)	462.4
		Approximate Chi Square Value (0.05)	4.708
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	4.044

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	785.4	95% Adjusted Gamma UCL (use when n<50)	914.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.811	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.295	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.635	Mean of logged Data	4.802
Maximum of Logged Data	7.45	SD of logged Data	1.346

Assuming Lognormal Distribution

95% H-UCL	1454	90% Chebyshev (MVUE) UCL	609.5
95% Chebyshev (MVUE) UCL	766.1	97.5% Chebyshev (MVUE) UCL	983.3
99% Chebyshev (MVUE) UCL	1410		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	606.3	95% Jackknife UCL	634.5
95% Standard Bootstrap UCL	592.5	95% Bootstrap-t UCL	2343
95% Hall's Bootstrap UCL	2189	95% Percentile Bootstrap UCL	619.6
95% BCA Bootstrap UCL	711.4		
90% Chebyshev(Mean, Sd) UCL	833.9	95% Chebyshev(Mean, Sd) UCL	1062
97.5% Chebyshev(Mean, Sd) UCL	1379	99% Chebyshev(Mean, Sd) UCL	2001

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1062

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lead (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	84.7	Mean	1491
Maximum	4340	Median	1380
SD	1463	Std. Error of Mean	517.1
Coefficient of Variation	0.981	Skewness	1.145

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.269	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	2471	95% Adjusted-CLT UCL (Chen-1995)	2566
		95% Modified-t UCL (Johnson-1978)	2506

Gamma GOF Test

A-D Test Statistic	0.325	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.228	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.302	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.922	k star (bias corrected MLE)	0.659
Theta hat (MLE)	1618	Theta star (bias corrected MLE)	2262
nu hat (MLE)	14.75	nu star (bias corrected)	10.55
MLE Mean (bias corrected)	1491	MLE Sd (bias corrected)	1836
		Approximate Chi Square Value (0.05)	4.288
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	3.338

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3669	95% Adjusted Gamma UCL (use when n<50)	4713

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.273	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.439	Mean of logged Data	6.675
Maximum of Logged Data	8.376	SD of logged Data	1.399

Assuming Lognormal Distribution

95% H-UCL	22324	90% Chebyshev (MVUE) UCL	4358
95% Chebyshev (MVUE) UCL	5543	97.5% Chebyshev (MVUE) UCL	7187
99% Chebyshev (MVUE) UCL	10418		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	2342	95% Jackknife UCL	2471
95% Standard Bootstrap UCL	2278	95% Bootstrap-t UCL	3072
95% Hall's Bootstrap UCL	7689	95% Percentile Bootstrap UCL	2362
95% BCA Bootstrap UCL	2435		
90% Chebyshev(Mean, Sd) UCL	3043	95% Chebyshev(Mean, Sd) UCL	3745
97.5% Chebyshev(Mean, Sd) UCL	4721	99% Chebyshev(Mean, Sd) UCL	6637

Suggested UCL to Use

95% Student's-t UCL 2471

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.

Lead (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	35.4	Mean	401.4
Maximum	990	Median	272.5
SD	366	Std. Error of Mean	129.4
Coefficient of Variation	0.912	Skewness	0.64

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.204	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	646.5	95% Adjusted-CLT UCL (Chen-1995)	645.5
		95% Modified-t UCL (Johnson-1978)	651.4

Gamma GOF Test

A-D Test Statistic	0.269	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.186	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.071	k star (bias corrected MLE)	0.753
Theta hat (MLE)	374.7	Theta star (bias corrected MLE)	533.1
nu hat (MLE)	17.14	nu star (bias corrected)	12.04
MLE Mean (bias corrected)	401.4	MLE Sd (bias corrected)	462.6
		Approximate Chi Square Value (0.05)	5.257
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.18

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	919.6	95% Adjusted Gamma UCL (use when n<50)	1157

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.567	Mean of logged Data	5.46
Maximum of Logged Data	6.898	SD of logged Data	1.24

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	3365	90% Chebyshev (MVUE) UCL	1031
95% Chebyshev (MVUE) UCL	1299	97.5% Chebyshev (MVUE) UCL	1670
99% Chebyshev (MVUE) UCL	2399		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	614.2	95% Jackknife UCL	646.5
95% Standard Bootstrap UCL	598.7	95% Bootstrap-t UCL	716.9
95% Hall's Bootstrap UCL	591.2	95% Percentile Bootstrap UCL	602.8
95% BCA Bootstrap UCL	638.9		
90% Chebyshev(Mean, Sd) UCL	789.5	95% Chebyshev(Mean, Sd) UCL	965.3
97.5% Chebyshev(Mean, Sd) UCL	1209	99% Chebyshev(Mean, Sd) UCL	1689

Suggested UCL to Use

95% Student's-t UCL 646.5

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.

Lead (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	93.4	Mean	422.6
Maximum	1060	Median	242
SD	387.6	Std. Error of Mean	137
Coefficient of Variation	0.917	Skewness	0.914

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.824	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.254	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	682.3	95% Adjusted-CLT UCL (Chen-1995)	695.3
		95% Modified-t UCL (Johnson-1978)	689.6

Gamma GOF Test

A-D Test Statistic	0.464	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.73	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.202	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.3	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.373	k star (bias corrected MLE)	0.942
Theta hat (MLE)	307.7	Theta star (bias corrected MLE)	448.8
nu hat (MLE)	21.97	nu star (bias corrected)	15.07
MLE Mean (bias corrected)	422.6	MLE Sd (bias corrected)	435.5
		Approximate Chi Square Value (0.05)	7.309
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	5.995

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	871.3	95% Adjusted Gamma UCL (use when n<50)	1062

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.158	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.537	Mean of logged Data	5.64
Maximum of Logged Data	6.966	SD of logged Data	0.982

Assuming Lognormal Distribution

95% H-UCL	1598	90% Chebyshev (MVUE) UCL	869.7
95% Chebyshev (MVUE) UCL	1073	97.5% Chebyshev (MVUE) UCL	1354
99% Chebyshev (MVUE) UCL	1908		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	648	95% Jackknife UCL	682.3
95% Standard Bootstrap UCL	636.4	95% Bootstrap-t UCL	875.7
95% Hall's Bootstrap UCL	686.6	95% Percentile Bootstrap UCL	648.4
95% BCA Bootstrap UCL	675.9		
90% Chebyshev(Mean, Sd) UCL	833.7	95% Chebyshev(Mean, Sd) UCL	1020
97.5% Chebyshev(Mean, Sd) UCL	1278	99% Chebyshev(Mean, Sd) UCL	1786

Suggested UCL to Use

95% Student's-t UCL 682.3

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.

Lead (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	14.9	Mean	1029
Maximum	3600	Median	916.5
SD	1203	Std. Error of Mean	425.4
Coefficient of Variation	1.169	Skewness	1.531

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.805	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.27	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	1835	95% Adjusted-CLT UCL (Chen-1995)	1975
		95% Modified-t UCL (Johnson-1978)	1873

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.457	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.759	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.308	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.547	k star (bias corrected MLE)	0.425
Theta hat (MLE)	1882	Theta star (bias corrected MLE)	2421
nu hat (MLE)	8.747	nu star (bias corrected)	6.8
MLE Mean (bias corrected)	1029	MLE Sd (bias corrected)	1578
		Approximate Chi Square Value (0.05)	2.062
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	1.467

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3394	95% Adjusted Gamma UCL (use when n<50)	4768

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.877	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.253	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.701	Mean of logged Data	5.79
Maximum of Logged Data	8.189	SD of logged Data	2.053

Assuming Lognormal Distribution

95% H-UCL	351969	90% Chebyshev (MVUE) UCL	4866
95% Chebyshev (MVUE) UCL	6354	97.5% Chebyshev (MVUE) UCL	8419
99% Chebyshev (MVUE) UCL	12475		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1729	95% Jackknife UCL	1835
95% Standard Bootstrap UCL	1679	95% Bootstrap-t UCL	2268
95% Hall's Bootstrap UCL	3859	95% Percentile Bootstrap UCL	1749
95% BCA Bootstrap UCL	1920		
90% Chebyshev(Mean, Sd) UCL	2305	95% Chebyshev(Mean, Sd) UCL	2883
97.5% Chebyshev(Mean, Sd) UCL	3686	99% Chebyshev(Mean, Sd) UCL	5262

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 1835

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Zinc (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	96.5	Mean	909.7
Maximum	2680	Median	491.5
SD	998.3	Std. Error of Mean	353
Coefficient of Variation	1.097	Skewness	1.352

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.739	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.371	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	1578	95% Adjusted-CLT UCL (Chen-1995)	1671
		95% Modified-t UCL (Johnson-1978)	1607

Gamma GOF Test

A-D Test Statistic	0.55	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.275	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	1.062	k star (bias corrected MLE)	0.747
Theta hat (MLE)	856.5	Theta star (bias corrected MLE)	1218
nu hat (MLE)	16.99	nu star (bias corrected)	11.95
MLE Mean (bias corrected)	909.7	MLE Sd (bias corrected)	1052
		Approximate Chi Square Value (0.05)	5.197
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.128

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	2092	95% Adjusted Gamma UCL (use when n<50)	2635

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.57	Mean of logged Data	6.273
Maximum of Logged Data	7.894	SD of logged Data	1.144

Assuming Lognormal Distribution

95% H-UCL	5247	90% Chebyshev (MVUE) UCL	2037
95% Chebyshev (MVUE) UCL	2547	97.5% Chebyshev (MVUE) UCL	3255
99% Chebyshev (MVUE) UCL	4647		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1490	95% Jackknife UCL	1578
95% Standard Bootstrap UCL	1452	95% Bootstrap-t UCL	3773
95% Hall's Bootstrap UCL	6783	95% Percentile Bootstrap UCL	1498
95% BCA Bootstrap UCL	1660		
90% Chebyshev(Mean, Sd) UCL	1969	95% Chebyshev(Mean, Sd) UCL	2448
97.5% Chebyshev(Mean, Sd) UCL	3114	99% Chebyshev(Mean, Sd) UCL	4422

Suggested UCL to Use

95% Adjusted Gamma UCL 2635

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Zinc (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	390	Mean	538.6
Maximum	753	Median	491
SD	148.2	Std. Error of Mean	56.02
Coefficient of Variation	0.275	Skewness	0.646

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.878	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.197	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	647.4	95% Adjusted-CLT UCL (Chen-1995)	645.3
		95% Modified-t UCL (Johnson-1978)	649.7

Gamma GOF Test

A-D Test Statistic	0.4	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.19	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.312	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	16.17	k star (bias corrected MLE)	9.336
Theta hat (MLE)	33.3	Theta star (bias corrected MLE)	57.68
nu hat (MLE)	226.4	nu star (bias corrected)	130.7
MLE Mean (bias corrected)	538.6	MLE Sd (bias corrected)	176.3
		Approximate Chi Square Value (0.05)	105.3
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	98.42

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	668.5	95% Adjusted Gamma UCL (use when n<50)	715.3

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.966	Mean of logged Data	6.258
Maximum of Logged Data	6.624	SD of logged Data	0.267

Assuming Lognormal Distribution

95% H-UCL	682.5	90% Chebyshev (MVUE) UCL	701.6
95% Chebyshev (MVUE) UCL	775.6	97.5% Chebyshev (MVUE) UCL	878.3
99% Chebyshev (MVUE) UCL	1080		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	630.7	95% Jackknife UCL	647.4
95% Standard Bootstrap UCL	623.9	95% Bootstrap-t UCL	702.3
95% Hall's Bootstrap UCL	670.6	95% Percentile Bootstrap UCL	628.4
95% BCA Bootstrap UCL	631		
90% Chebyshev(Mean, Sd) UCL	706.6	95% Chebyshev(Mean, Sd) UCL	782.8
97.5% Chebyshev(Mean, Sd) UCL	888.4	99% Chebyshev(Mean, Sd) UCL	1096

Suggested UCL to Use

95% Student's-t UCL 647.4

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.

Zinc (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	124	Mean	828.5
Maximum	3130	Median	402
SD	995.8	Std. Error of Mean	352.1
Coefficient of Variation	1.202	Skewness	2.183

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.716	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.29	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	1496	95% Adjusted-CLT UCL (Chen-1995)	1698
		95% Modified-t UCL (Johnson-1978)	1541

Gamma GOF Test

A-D Test Statistic	0.41	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.26	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.113	k star (bias corrected MLE)	0.779
Theta hat (MLE)	744.3	Theta star (bias corrected MLE)	1064
nu hat (MLE)	17.81	nu star (bias corrected)	12.46
MLE Mean (bias corrected)	828.5	MLE Sd (bias corrected)	938.7
		Approximate Chi Square Value (0.05)	5.534
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.423

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1866	95% Adjusted Gamma UCL (use when n<50)	2335

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.82	Mean of logged Data	6.207
Maximum of Logged Data	8.049	SD of logged Data	1.061

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	3663	90% Chebyshev (MVUE) UCL	1705
95% Chebyshev (MVUE) UCL	2118	97.5% Chebyshev (MVUE) UCL	2691
99% Chebyshev (MVUE) UCL	3816		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1408	95% Jackknife UCL	1496
95% Standard Bootstrap UCL	1370	95% Bootstrap-t UCL	2718
95% Hall's Bootstrap UCL	3526	95% Percentile Bootstrap UCL	1411
95% BCA Bootstrap UCL	1671		
90% Chebyshev(Mean, Sd) UCL	1885	95% Chebyshev(Mean, Sd) UCL	2363
97.5% Chebyshev(Mean, Sd) UCL	3027	99% Chebyshev(Mean, Sd) UCL	4331

Suggested UCL to Use

95% Adjusted Gamma UCL 2335

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.

Zinc (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	156	Mean	786.1
Maximum	1530	Median	752.5
SD	467.4	Std. Error of Mean	165.2
Coefficient of Variation	0.595	Skewness	0.526

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1099	95% Adjusted-CLT UCL (Chen-1995)	1091
		95% Modified-t UCL (Johnson-1978)	1104

Gamma GOF Test

A-D Test Statistic	0.257	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.147	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.297	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.725	k star (bias corrected MLE)	1.786
Theta hat (MLE)	288.5	Theta star (bias corrected MLE)	440.1
nu hat (MLE)	43.6	nu star (bias corrected)	28.58
MLE Mean (bias corrected)	786.1	MLE Sd (bias corrected)	588.2
		Approximate Chi Square Value (0.05)	17.38
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	15.21

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1293	95% Adjusted Gamma UCL (use when n<50)	1477

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.05	Mean of logged Data	6.473
Maximum of Logged Data	7.333	SD of logged Data	0.729

Assuming Lognormal Distribution

95% H-UCL	1823	90% Chebyshev (MVUE) UCL	1450
95% Chebyshev (MVUE) UCL	1739	97.5% Chebyshev (MVUE) UCL	2140
99% Chebyshev (MVUE) UCL	2928		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	1058	95% Jackknife UCL	1099
95% Standard Bootstrap UCL	1041	95% Bootstrap-t UCL	1239
95% Hall's Bootstrap UCL	1351	95% Percentile Bootstrap UCL	1051
95% BCA Bootstrap UCL	1062		
90% Chebyshev(Mean, Sd) UCL	1282	95% Chebyshev(Mean, Sd) UCL	1506
97.5% Chebyshev(Mean, Sd) UCL	1818	99% Chebyshev(Mean, Sd) UCL	2430

Suggested UCL to Use

95% Student's-t UCL 1099

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.

Zinc (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	49.7	Mean	302.7
Maximum	1530	Median	91.8
SD	485.7	Std. Error of Mean	146.5
Coefficient of Variation	1.605	Skewness	2.195

Normal GOF Test

Shapiro Wilk Test Statistic	0.563	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.447	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	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	568.1	95% Adjusted-CLT UCL (Chen-1995)	647.2
		95% Modified-t UCL (Johnson-1978)	584.3

Gamma GOF Test

A-D Test Statistic	1.834	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.395	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.265	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	0.783	k star (bias corrected MLE)	0.63
Theta hat (MLE)	386.5	Theta star (bias corrected MLE)	480.3
nu hat (MLE)	17.23	nu star (bias corrected)	13.87
MLE Mean (bias corrected)	302.7	MLE Sd (bias corrected)	381.3
		Approximate Chi Square Value (0.05)	6.479
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	5.676

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	647.8	95% Adjusted Gamma UCL (use when n<50)	739.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.748	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.315	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.906	Mean of logged Data	4.953
Maximum of Logged Data	7.333	SD of logged Data	1.11

Assuming Lognormal Distribution

95% H-UCL	809.2	90% Chebyshev (MVUE) UCL	501
95% Chebyshev (MVUE) UCL	618.4	97.5% Chebyshev (MVUE) UCL	781.2
99% Chebyshev (MVUE) UCL	1101		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	543.6	95% Jackknife UCL	568.1
95% Standard Bootstrap UCL	538.3	95% Bootstrap-t UCL	3988
95% Hall's Bootstrap UCL	2382	95% Percentile Bootstrap UCL	558.5
95% BCA Bootstrap UCL	648.2		
90% Chebyshev(Mean, Sd) UCL	742.1	95% Chebyshev(Mean, Sd) UCL	941.1
97.5% Chebyshev(Mean, Sd) UCL	1217	99% Chebyshev(Mean, Sd) UCL	1760

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 941.1

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Zinc (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	133	Mean	1167
Maximum	4730	Median	585
SD	1563	Std. Error of Mean	552.5
Coefficient of Variation	1.339	Skewness	2.135

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.697	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.352	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	2214	95% Adjusted-CLT UCL (Chen-1995)	2521
		95% Modified-t UCL (Johnson-1978)	2283

Gamma GOF Test

A-D Test Statistic	0.459	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.254	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.302	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.901	k star (bias corrected MLE)	0.647
Theta hat (MLE)	1295	Theta star (bias corrected MLE)	1804
nu hat (MLE)	14.42	nu star (bias corrected)	10.35
MLE Mean (bias corrected)	1167	MLE Sd (bias corrected)	1451
		Approximate Chi Square Value (0.05)	4.159
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	3.227

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	2902	95% Adjusted Gamma UCL (use when n<50)	3741

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.175	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.89	Mean of logged Data	6.413
Maximum of Logged Data	8.462	SD of logged Data	1.189

Assuming Lognormal Distribution

95% H-UCL	7145	90% Chebyshev (MVUE) UCL	2492
95% Chebyshev (MVUE) UCL	3127	97.5% Chebyshev (MVUE) UCL	4008
99% Chebyshev (MVUE) UCL	5739		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	2076	95% Jackknife UCL	2214
95% Standard Bootstrap UCL	2039	95% Bootstrap-t UCL	6251
95% Hall's Bootstrap UCL	7140	95% Percentile Bootstrap UCL	2085
95% BCA Bootstrap UCL	2455		
90% Chebyshev(Mean, Sd) UCL	2824	95% Chebyshev(Mean, Sd) UCL	3575
97.5% Chebyshev(Mean, Sd) UCL	4617	99% Chebyshev(Mean, Sd) UCL	6664

Suggested UCL to Use

95% Adjusted Gamma UCL 3741

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.

Zinc (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	65.6	Mean	346.8
Maximum	1110	Median	184
SD	382.7	Std. Error of Mean	135.3
Coefficient of Variation	1.103	Skewness	1.543

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.758	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.331	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	603.2	95% Adjusted-CLT UCL (Chen-1995)	648.3
		95% Modified-t UCL (Johnson-1978)	615.5

Gamma GOF Test

A-D Test Statistic	0.492	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.228	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.164	k star (bias corrected MLE)	0.811
Theta hat (MLE)	297.9	Theta star (bias corrected MLE)	427.6
nu hat (MLE)	18.63	nu star (bias corrected)	12.98
MLE Mean (bias corrected)	346.8	MLE Sd (bias corrected)	385.1
		Approximate Chi Square Value (0.05)	5.877
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.725

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	765.8	95% Adjusted Gamma UCL (use when n<50)	952.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.161	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.184	Mean of logged Data	5.362
Maximum of Logged Data	7.012	SD of logged Data	1.036

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	1443	90% Chebyshev (MVUE) UCL	707.2
95% Chebyshev (MVUE) UCL	876.5	97.5% Chebyshev (MVUE) UCL	1112
99% Chebyshev (MVUE) UCL	1573		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	569.4	95% Jackknife UCL	603.2
95% Standard Bootstrap UCL	557.2	95% Bootstrap-t UCL	1346
95% Hall's Bootstrap UCL	2051	95% Percentile Bootstrap UCL	561.8
95% BCA Bootstrap UCL	623.1		
90% Chebyshev(Mean, Sd) UCL	752.7	95% Chebyshev(Mean, Sd) UCL	936.6
97.5% Chebyshev(Mean, Sd) UCL	1192	99% Chebyshev(Mean, Sd) UCL	1693

Suggested UCL to Use

95% Adjusted Gamma UCL 952.6

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.

Zinc (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	104	Mean	915.9
Maximum	4620	Median	278
SD	1526	Std. Error of Mean	539.5
Coefficient of Variation	1.666	Skewness	2.624

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.581	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.371	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1938	95% Adjusted-CLT UCL (Chen-1995)	2338
		95% Modified-t UCL (Johnson-1978)	2022

Gamma GOF Test

A-D Test Statistic	0.737	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.281	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.75	k star (bias corrected MLE)	0.552
Theta hat (MLE)	1222	Theta star (bias corrected MLE)	1660
nu hat (MLE)	11.99	nu star (bias corrected)	8.83
MLE Mean (bias corrected)	915.9	MLE Sd (bias corrected)	1233
		Approximate Chi Square Value (0.05)	3.224
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.43

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	2508	95% Adjusted Gamma UCL (use when n<50)	3328

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.644	Mean of logged Data	6.021
Maximum of Logged Data	8.438	SD of logged Data	1.226

Assuming Lognormal Distribution

95% H-UCL	5590	90% Chebyshev (MVUE) UCL	1774
95% Chebyshev (MVUE) UCL	2232	97.5% Chebyshev (MVUE) UCL	2867
99% Chebyshev (MVUE) UCL	4115		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	1803	95% Jackknife UCL	1938
95% Standard Bootstrap UCL	1754	95% Bootstrap-t UCL	4528
95% Hall's Bootstrap UCL	5083	95% Percentile Bootstrap UCL	1929
95% BCA Bootstrap UCL	2406		
90% Chebyshev(Mean, Sd) UCL	2535	95% Chebyshev(Mean, Sd) UCL	3268
97.5% Chebyshev(Mean, Sd) UCL	4285	99% Chebyshev(Mean, Sd) UCL	6284

Suggested UCL to Use

95% Adjusted Gamma UCL 3328

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.

Zinc (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	32.7	Mean	415.9
Maximum	960	Median	370.5
SD	350.9	Std. Error of Mean	124.1
Coefficient of Variation	0.844	Skewness	0.386

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.212	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	650.9	95% Adjusted-CLT UCL (Chen-1995)	638
		95% Modified-t UCL (Johnson-1978)	653.7

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.348	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.213	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.072	k star (bias corrected MLE)	0.753
Theta hat (MLE)	388.1	Theta star (bias corrected MLE)	552.2
nu hat (MLE)	17.15	nu star (bias corrected)	12.05
MLE Mean (bias corrected)	415.9	MLE Sd (bias corrected)	479.2
		Approximate Chi Square Value (0.05)	5.26
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.183

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	952.8	95% Adjusted Gamma UCL (use when n<50)	1198

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.221	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.487	Mean of logged Data	5.496
Maximum of Logged Data	6.867	SD of logged Data	1.294

Assuming Lognormal Distribution

95% H-UCL	4359	90% Chebyshev (MVUE) UCL	1154
95% Chebyshev (MVUE) UCL	1459	97.5% Chebyshev (MVUE) UCL	1882
99% Chebyshev (MVUE) UCL	2712		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	619.9	95% Jackknife UCL	650.9
95% Standard Bootstrap UCL	605.1	95% Bootstrap-t UCL	661.8
95% Hall's Bootstrap UCL	604.6	95% Percentile Bootstrap UCL	612.3
95% BCA Bootstrap UCL	623.6		
90% Chebyshev(Mean, Sd) UCL	788	95% Chebyshev(Mean, Sd) UCL	956.6
97.5% Chebyshev(Mean, Sd) UCL	1191	99% Chebyshev(Mean, Sd) UCL	1650

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 650.9

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 Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/4/2018 11:50:47 AM
From File	2018_05_21 Eco SO (2018) ProUCL input (StS-10 to -18) - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	7.67	Minimum Non-Detect	7.42
Maximum Detect	18.8	Maximum Non-Detect	7.48
Variance Detects	23.18	Percent Non-Detects	50%
Mean Detects	13.19	SD Detects	4.815
Median Detects	13.15	CV Detects	0.365
Skewness Detects	0.0414	Kurtosis Detects	-1.42
Mean of Logged Detects	2.525	SD of Logged Detects	0.389

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.991	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.16	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10.31	KM Standard Error of Mean	1.684
KM SD	4.126	95% KM (BCA) UCL	N/A
95% KM (t) UCL	13.5	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	13.08	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	15.36	95% KM Chebyshev UCL	17.65
97.5% KM Chebyshev UCL	20.83	99% KM Chebyshev UCL	27.07

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.212	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.202	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.395	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)	9.388	k star (bias corrected MLE)	2.514
Theta hat (MLE)	1.405	Theta star (bias corrected MLE)	5.248
nu hat (MLE)	75.11	nu star (bias corrected)	20.11
Mean (detects)	13.19		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.891
Maximum	18.8	Median	4.882
SD	7.466	CV	1.083
k hat (MLE)	0.396	k star (bias corrected MLE)	0.331
Theta hat (MLE)	17.4	Theta star (bias corrected MLE)	20.82
nu hat (MLE)	6.338	nu star (bias corrected)	5.295
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.29, α)	1.291	Adjusted Chi Square Value (5.29, β)	0.86
95% Gamma Approximate UCL (use when n>=50)	28.27	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.31	SD (KM)	4.126
Variance (KM)	17.02	SE of Mean (KM)	1.684
k hat (KM)	6.239	k star (KM)	3.983
nu hat (KM)	99.83	nu star (KM)	63.73
theta hat (KM)	1.652	theta star (KM)	2.588
80% gamma percentile (KM)	14.22	90% gamma percentile (KM)	17.23
95% gamma percentile (KM)	20	99% gamma percentile (KM)	25.92

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (63.73, α)	46.36	Adjusted Chi Square Value (63.73, β)	42.64
95% Gamma Approximate KM-UCL (use when n>=50)	14.17	95% Gamma Adjusted KM-UCL (use when n<50)	15.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	8.487	Mean in Log Scale	1.921
SD in Original Scale	5.954	SD in Log Scale	0.705
95% t UCL (assumes normality of ROS data)	12.48	95% Percentile Bootstrap UCL	11.89
95% BCA Bootstrap UCL	12.82	95% Bootstrap t UCL	14.2
95% H-UCL (Log ROS)	18.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.265	KM Geo Mean	9.629
KM SD (logged)	0.353	95% Critical H Value (KM-Log)	2.128
KM Standard Error of Mean (logged)	0.144	95% H-UCL (KM -Log)	13.61
KM SD (logged)	0.353	95% Critical H Value (KM-Log)	2.128
KM Standard Error of Mean (logged)	0.144		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	8.456	Mean in Log Scale	1.92
SD in Original Scale	5.964	SD in Log Scale	0.696
95% t UCL (Assumes normality)	12.45	95% H-Stat UCL	17.79

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	13.5

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.

Arsenic (sts-11)

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	11.3	Mean	32.66
Maximum	74.8	Median	20.95
SD	24.87	Std. Error of Mean	8.792
Coefficient of Variation	0.761	Skewness	0.907

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.834	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.269	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	49.32	95% Adjusted-CLT UCL (Chen-1995)	50.13
		95% Modified-t UCL (Johnson-1978)	49.79

Gamma GOF Test

A-D Test Statistic	0.507	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.212	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.297	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.123	k star (bias corrected MLE)	1.41
Theta hat (MLE)	15.38	Theta star (bias corrected MLE)	23.16
nu hat (MLE)	33.97	nu star (bias corrected)	22.57
MLE Mean (bias corrected)	32.66	MLE Sd (bias corrected)	27.5
		Approximate Chi Square Value (0.05)	12.76
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	10.94

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	57.75	95% Adjusted Gamma UCL (use when n<50)	67.34

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.165	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.425	Mean of logged Data	3.233
Maximum of Logged Data	4.315	SD of logged Data	0.757

Assuming Lognormal Distribution

95% H-UCL	76.44	90% Chebyshev (MVUE) UCL	58.79
95% Chebyshev (MVUE) UCL	70.77	97.5% Chebyshev (MVUE) UCL	87.39
99% Chebyshev (MVUE) UCL	120		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	47.12	95% Jackknife UCL	49.32
95% Standard Bootstrap UCL	46.4	95% Bootstrap-t UCL	61.58
95% Hall's Bootstrap UCL	47.68	95% Percentile Bootstrap UCL	47.01
95% BCA Bootstrap UCL	48.19		
90% Chebyshev(Mean, Sd) UCL	59.04	95% Chebyshev(Mean, Sd) UCL	70.98
97.5% Chebyshev(Mean, Sd) UCL	87.57	99% Chebyshev(Mean, Sd) UCL	120.1

Suggested UCL to Use

95% Student's-t UCL	49.32

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.

Arsenic (sts-12)

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	102	Minimum Non-Detect	9.55
Maximum Detect	327	Maximum Non-Detect	11.1
Variance Detects	10608	Percent Non-Detects	37.5%
Mean Detects	202.2	SD Detects	103
Median Detects	188	CV Detects	0.509
Skewness Detects	0.258	Kurtosis Detects	-2.632
Mean of Logged Detects	5.196	SD of Logged Detects	0.544

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.225	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	130	KM Standard Error of Mean	46.78
KM SD	118.3	95% KM (BCA) UCL	197.9
95% KM (t) UCL	218.6	95% KM (Percentile Bootstrap) UCL	198.8
95% KM (z) UCL	206.9	95% KM Bootstrap t UCL	197.4
90% KM Chebyshev UCL	270.3	95% KM Chebyshev UCL	333.8
97.5% KM Chebyshev UCL	422.1	99% KM Chebyshev UCL	595.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.408	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.681	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.26	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.358	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)	4.558	k star (bias corrected MLE)	1.956
Theta hat (MLE)	44.37	Theta star (bias corrected MLE)	103.4
nu hat (MLE)	45.58	nu star (bias corrected)	19.56
Mean (detects)	202.2		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	126.4
Maximum	327	Median	104
SD	130.4	CV	1.032
k hat (MLE)	0.219	k star (bias corrected MLE)	0.22
Theta hat (MLE)	578	Theta star (bias corrected MLE)	574.5
nu hat (MLE)	3.498	nu star (bias corrected)	3.52
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.52, α)	0.542	Adjusted Chi Square Value (3.52, β)	0.32
95% Gamma Approximate UCL (use when n>=50)	821.1	95% Gamma Adjusted UCL (use when n<50)	1389

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	130	SD (KM)	118.3
Variance (KM)	14003	SE of Mean (KM)	46.78
k hat (KM)	1.206	k star (KM)	0.837
nu hat (KM)	19.3	nu star (KM)	13.39
theta hat (KM)	107.7	theta star (KM)	155.2
80% gamma percentile (KM)	211.8	90% gamma percentile (KM)	312.5
95% gamma percentile (KM)	414.8	99% gamma percentile (KM)	655.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.39, α)	6.159	Adjusted Chi Square Value (13.39, β)	4.973
95% Gamma Approximate KM-UCL (use when n>=50)	282.6	95% Gamma Adjusted KM-UCL (use when n<50)	350

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	142.3	Mean in Log Scale	4.652
SD in Original Scale	113.6	SD in Log Scale	0.855
95% t UCL (assumes normality of ROS data)	218.4	95% Percentile Bootstrap UCL	208.5
95% BCA Bootstrap UCL	206	95% Bootstrap t UCL	267.7
95% H-UCL (Log ROS)	408.6		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.093	KM Geo Mean	59.94
KM SD (logged)	1.474	95% Critical H Value (KM-Log)	4.669
KM Standard Error of Mean (logged)	0.583	95% H-UCL (KM -Log)	2394
KM SD (logged)	1.474	95% Critical H Value (KM-Log)	4.669
KM Standard Error of Mean (logged)	0.583		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	128.3	Mean in Log Scale	3.858
SD in Original Scale	128.3	SD in Log Scale	1.892
95% t UCL (Assumes normality)	214.2	95% H-Stat UCL	18342

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 218.6

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.

Arsenic (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	8.38	Minimum Non-Detect	7.4
Maximum Detect	386	Maximum Non-Detect	7.46
Variance Detects	20178	Percent Non-Detects	25%
Mean Detects	101.4	SD Detects	142
Median Detects	59.05	CV Detects	1.401
Skewness Detects	2.248	Kurtosis Detects	5.258
Mean of Logged Detects	3.906	SD of Logged Detects	1.327

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.674	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.396	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	77.9	KM Standard Error of Mean	46.26
KM SD	119.4	95% KM (BCA) UCL	168.7
95% KM (t) UCL	165.5	95% KM (Percentile Bootstrap) UCL	162.5
95% KM (z) UCL	154	95% KM Bootstrap t UCL	336.1
90% KM Chebyshev UCL	216.7	95% KM Chebyshev UCL	279.5
97.5% KM Chebyshev UCL	366.8	99% KM Chebyshev UCL	538.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.407	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.719	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.27	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.343	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)	0.828	k star (bias corrected MLE)	0.525
Theta hat (MLE)	122.4	Theta star (bias corrected MLE)	193.1
nu hat (MLE)	9.938	nu star (bias corrected)	6.302
Mean (detects)	101.4		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	76.05
Maximum	386	Median	36.8
SD	128.9	CV	1.695
k hat (MLE)	0.274	k star (bias corrected MLE)	0.255
Theta hat (MLE)	277.5	Theta star (bias corrected MLE)	298.7
nu hat (MLE)	4.385	nu star (bias corrected)	4.074
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.07, α)	0.751	Adjusted Chi Square Value (4.07, β)	0.463
95% Gamma Approximate UCL (use when n>=50)	412.5	95% Gamma Adjusted UCL (use when n<50)	669.8

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	77.9	SD (KM)	119.4
Variance (KM)	14268	SE of Mean (KM)	46.26
k hat (KM)	0.425	k star (KM)	0.349
nu hat (KM)	6.805	nu star (KM)	5.586
theta hat (KM)	183.2	theta star (KM)	223.1
80% gamma percentile (KM)	123.3	90% gamma percentile (KM)	225
95% gamma percentile (KM)	339	99% gamma percentile (KM)	630

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.59, α)	1.432	Adjusted Chi Square Value (5.59, β)	0.969
95% Gamma Approximate KM-UCL (use when n>=50)	303.8	95% Gamma Adjusted KM-UCL (use when n<50)	449.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	76.5	Mean in Log Scale	3.077
SD in Original Scale	128.6	SD in Log Scale	1.901
95% t UCL (assumes normality of ROS data)	162.6	95% Percentile Bootstrap UCL	162.9
95% BCA Bootstrap UCL	202.7	95% Bootstrap t UCL	360.6
95% H-UCL (Log ROS)	8856		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.43	KM Geo Mean	30.86
KM SD (logged)	1.335	95% Critical H Value (KM-Log)	4.292
KM Standard Error of Mean (logged)	0.517	95% H-UCL (KM -Log)	655.5
KM SD (logged)	1.335	95% Critical H Value (KM-Log)	4.292
KM Standard Error of Mean (logged)	0.517		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	76.98	Mean in Log Scale	3.257
SD in Original Scale	128.3	SD in Log Scale	1.643
95% t UCL (Assumes normality)	162.9	95% H-Stat UCL	2430

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 Bootstrap t UCL	336.1	ma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	449.2

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

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.

Arsenic (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	8.03	Minimum Non-Detect	7.4
Maximum Detect	65.9	Maximum Non-Detect	7.4
Variance Detects	691.3	Percent Non-Detects	20%
Mean Detects	28.61	SD Detects	26.29
Median Detects	20.25	CV Detects	0.919
Skewness Detects	1.429	Kurtosis Detects	1.709
Mean of Logged Detects	3.032	SD of Logged Detects	0.928

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.865	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.259	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	24.37	KM Standard Error of Mean	11.39
KM SD	22.06	95% KM (BCA) UCL	N/A
95% KM (t) UCL	48.65	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	43.11	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	58.55	95% KM Chebyshev UCL	74.03
97.5% KM Chebyshev UCL	95.52	99% KM Chebyshev UCL	137.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.282	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.704	k star (bias corrected MLE)	0.593
Theta hat (MLE)	16.79	Theta star (bias corrected MLE)	48.28
nu hat (MLE)	13.63	nu star (bias corrected)	4.74
Mean (detects)	28.61		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	22.89
Maximum	65.9	Median	12.5
SD	26.12	CV	1.141
k hat (MLE)	0.404	k star (bias corrected MLE)	0.295
Theta hat (MLE)	56.64	Theta star (bias corrected MLE)	77.59
nu hat (MLE)	4.041	nu star (bias corrected)	2.95
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.95, α)	0.358	Adjusted Chi Square Value (2.95, β)	0.134
95% Gamma Approximate UCL (use when n>=50)	188.8	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	24.37	SD (KM)	22.06
Variance (KM)	486.8	SE of Mean (KM)	11.39
k hat (KM)	1.22	k star (KM)	0.621
nu hat (KM)	12.2	nu star (KM)	6.212
theta hat (KM)	19.98	theta star (KM)	39.22
80% gamma percentile (KM)	40.15	90% gamma percentile (KM)	62.88
95% gamma percentile (KM)	86.59	99% gamma percentile (KM)	143.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.21, α)	1.749	Adjusted Chi Square Value (6.21, β)	0.906
95% Gamma Approximate KM-UCL (use when n>=50)	86.53	95% Gamma Adjusted KM-UCL (use when n<50)	167

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	23.23	Mean in Log Scale	2.531
SD in Original Scale	25.76	SD in Log Scale	1.378
95% t UCL (assumes normality of ROS data)	47.78	95% Percentile Bootstrap UCL	42.75
95% BCA Bootstrap UCL	46.75	95% Bootstrap t UCL	108.4
95% H-UCL (Log ROS)	3018		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.826	KM Geo Mean	16.88
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	4.18
KM Standard Error of Mean (logged)	0.428	95% H-UCL (KM -Log)	134.5
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	4.18
KM Standard Error of Mean (logged)	0.428		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	23.63	Mean in Log Scale	2.688
SD in Original Scale	25.35	SD in Log Scale	1.114
95% t UCL (Assumes normality)	47.79	95% H-Stat UCL	552

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	48.65

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.

Arsenic (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	135	Minimum Non-Detect	7.35
Maximum Detect	1140	Maximum Non-Detect	11.6
Variance Detects	142322	Percent Non-Detects	25%
Mean Detects	403	SD Detects	377.3
Median Detects	262	CV Detects	0.936
Skewness Detects	2.027	Kurtosis Detects	4.255
Mean of Logged Detects	5.72	SD of Logged Detects	0.768

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.743	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.297	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	304.1	KM Standard Error of Mean	133.2
KM SD	344	95% KM (BCA) UCL	526.1
95% KM (t) UCL	556.5	95% KM (Percentile Bootstrap) UCL	526.1
95% KM (z) UCL	523.2	95% KM Bootstrap t UCL	837.1
90% KM Chebyshev UCL	703.7	95% KM Chebyshev UCL	884.7
97.5% KM Chebyshev UCL	1136	99% KM Chebyshev UCL	1630

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.446	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.263	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.336	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)	1.943	k star (bias corrected MLE)	1.083
Theta hat (MLE)	207.4	Theta star (bias corrected MLE)	372.3
nu hat (MLE)	23.32	nu star (bias corrected)	12.99
Mean (detects)	403		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	302.3
Maximum	1140	Median	208.5
SD	369.4	CV	1.222
k hat (MLE)	0.272	k star (bias corrected MLE)	0.254
Theta hat (MLE)	1110	Theta star (bias corrected MLE)	1192
nu hat (MLE)	4.357	nu star (bias corrected)	4.056
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.06, α)	0.744	Adjusted Chi Square Value (4.06, β)	0.458
95% Gamma Approximate UCL (use when n>=50)	1648	95% Gamma Adjusted UCL (use when n<50)	2679

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	304.1	SD (KM)	344
Variance (KM)	118302	SE of Mean (KM)	133.2
k hat (KM)	0.782	k star (KM)	0.572
nu hat (KM)	12.51	nu star (KM)	9.15
theta hat (KM)	389	theta star (KM)	531.8
80% gamma percentile (KM)	501.2	90% gamma percentile (KM)	799.4
95% gamma percentile (KM)	1113	99% gamma percentile (KM)	1876

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.15, α)	3.418	Adjusted Chi Square Value (9.15, β)	2.593
95% Gamma Approximate KM-UCL (use when n>=50)	814.1	95% Gamma Adjusted KM-UCL (use when n<50)	1073

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	313.2	Mean in Log Scale	5.236
SD in Original Scale	359.6	SD in Log Scale	1.107
95% t UCL (assumes normality of ROS data)	554.1	95% Percentile Bootstrap UCL	528.4
95% BCA Bootstrap UCL	594.8	95% Bootstrap t UCL	931.9
95% H-UCL (Log ROS)	1627		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.789	KM Geo Mean	120.1
KM SD (logged)	1.724	95% Critical H Value (KM-Log)	5.358
KM Standard Error of Mean (logged)	0.668	95% H-UCL (KM -Log)	17404
KM SD (logged)	1.724	95% Critical H Value (KM-Log)	5.358
KM Standard Error of Mean (logged)	0.668		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	303.4	Mean in Log Scale	4.672
SD in Original Scale	368.3	SD in Log Scale	2.049
95% t UCL (Assumes normality)	550.1	95% H-Stat UCL	112488

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	556.5

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	16.8	Mean	81.7
Maximum	253	Median	50.9
SD	80.83	Std. Error of Mean	28.58
Coefficient of Variation	0.989	Skewness	1.568

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.81	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	135.8	95% Adjusted-CLT UCL (Chen-1995)	145.6
		95% Modified-t UCL (Johnson-1978)	138.5

Gamma GOF Test

A-D Test Statistic	0.363	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.184	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.3	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.335	k star (bias corrected MLE)	0.918
Theta hat (MLE)	61.18	Theta star (bias corrected MLE)	89
nu hat (MLE)	21.37	nu star (bias corrected)	14.69
MLE Mean (bias corrected)	81.7	MLE Sd (bias corrected)	85.27
		Approximate Chi Square Value (0.05)	7.045
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	5.76

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	170.3	95% Adjusted Gamma UCL (use when n<50)	208.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.821	Mean of logged Data	3.984
Maximum of Logged Data	5.533	SD of logged Data	0.988

Assuming Lognormal Distribution

95% H-UCL	310.9	90% Chebyshev (MVUE) UCL	167.3
95% Chebyshev (MVUE) UCL	206.5	97.5% Chebyshev (MVUE) UCL	260.9
99% Chebyshev (MVUE) UCL	367.7		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	128.7	95% Jackknife UCL	135.8
95% Standard Bootstrap UCL	125.2	95% Bootstrap-t UCL	175.1
95% Hall's Bootstrap UCL	167.8	95% Percentile Bootstrap UCL	125.1
95% BCA Bootstrap UCL	139.2		
90% Chebyshev(Mean, Sd) UCL	167.4	95% Chebyshev(Mean, Sd) UCL	206.3
97.5% Chebyshev(Mean, Sd) UCL	260.2	99% Chebyshev(Mean, Sd) UCL	366.1

Suggested UCL to Use

95% Student's-t UCL 135.8

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	12.9	Minimum Non-Detect	7.14
Maximum Detect	68.5	Maximum Non-Detect	7.48
Variance Detects	518	Percent Non-Detects	37.5%
Mean Detects	29.64	SD Detects	22.76
Median Detects	26.2	CV Detects	0.768
Skewness Detects	1.755	Kurtosis Detects	3.316
Mean of Logged Detects	3.19	SD of Logged Detects	0.68

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.783	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.343	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	21.2	KM Standard Error of Mean	7.681
KM SD	19.43	95% KM (BCA) UCL	34.31
95% KM (t) UCL	35.76	95% KM (Percentile Bootstrap) UCL	34.1
95% KM (z) UCL	33.84	95% KM Bootstrap t UCL	48.35
90% KM Chebyshev UCL	44.25	95% KM Chebyshev UCL	54.69
97.5% KM Chebyshev UCL	69.17	99% KM Chebyshev UCL	97.63

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.453	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.272	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.36	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)	2.662	k star (bias corrected MLE)	1.198
Theta hat (MLE)	11.14	Theta star (bias corrected MLE)	24.74
nu hat (MLE)	26.62	nu star (bias corrected)	11.98
Mean (detects)	29.64		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	18.53
Maximum	68.5	Median	13.15
SD	23.05	CV	1.244
k hat (MLE)	0.265	k star (bias corrected MLE)	0.249
Theta hat (MLE)	69.86	Theta star (bias corrected MLE)	74.39
nu hat (MLE)	4.243	nu star (bias corrected)	3.985
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.99, α)	0.716	Adjusted Chi Square Value (3.99, β)	0.438
95% Gamma Approximate UCL (use when n>=50)	103.1	95% Gamma Adjusted UCL (use when n<50)	168.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	21.2	SD (KM)	19.43
Variance (KM)	377.6	SE of Mean (KM)	7.681
k hat (KM)	1.19	k star (KM)	0.827
nu hat (KM)	19.05	nu star (KM)	13.24
theta hat (KM)	17.81	theta star (KM)	25.63
80% gamma percentile (KM)	34.58	90% gamma percentile (KM)	51.14

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

95% gamma percentile (KM)	67.95	99% gamma percentile (KM)	107.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.24, α)	6.053	Adjusted Chi Square Value (13.24, β)	4.88
95% Gamma Approximate KM-UCL (use when n>=50)	46.37	95% Gamma Adjusted KM-UCL (use when n<50)	57.52

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	19.99	Mean in Log Scale	2.505
SD in Original Scale	21.76	SD in Log Scale	1.076
95% t UCL (assumes normality of ROS data)	34.56	95% Percentile Bootstrap UCL	32.81
95% BCA Bootstrap UCL	37.99	95% Bootstrap t UCL	48.08
95% H-UCL (Log ROS)	94.9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.731	KM Geo Mean	15.34
KM SD (logged)	0.763	95% Critical H Value (KM-Log)	2.87
KM Standard Error of Mean (logged)	0.302	95% H-UCL (KM -Log)	46.96
KM SD (logged)	0.763	95% Critical H Value (KM-Log)	2.87
KM Standard Error of Mean (logged)	0.302		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	19.89	Mean in Log Scale	2.479
SD in Original Scale	21.84	SD in Log Scale	1.108
95% t UCL (Assumes normality)	34.52	95% H-Stat UCL	103.4

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	35.76

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Arsenic (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	6	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	8.02	Minimum Non-Detect	7.46
Maximum Detect	27.6	Maximum Non-Detect	7.5
Variance Detects	53.92	Percent Non-Detects	33.33%
Mean Detects	13.29	SD Detects	7.343
Median Detects	11.1	CV Detects	0.553
Skewness Detects	1.989	Kurtosis Detects	4.231
Mean of Logged Detects	2.488	SD of Logged Detects	0.457

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.753	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.305	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	11.34	KM Standard Error of Mean	2.236
KM SD	6.124	95% KM (BCA) UCL	14.89
95% KM (t) UCL	15.5	95% KM (Percentile Bootstrap) UCL	15.35
95% KM (z) UCL	15.02	95% KM Bootstrap t UCL	22.17
90% KM Chebyshev UCL	18.05	95% KM Chebyshev UCL	21.09
97.5% KM Chebyshev UCL	25.31	99% KM Chebyshev UCL	33.59

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.546	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.333	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)	5.232	k star (bias corrected MLE)	2.727
Theta hat (MLE)	2.539	Theta star (bias corrected MLE)	4.872
nu hat (MLE)	62.78	nu star (bias corrected)	32.72
Mean (detects)	13.29		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.86
Maximum	27.6	Median	8.09
SD	8.818	CV	0.995
k hat (MLE)	0.33	k star (bias corrected MLE)	0.294
Theta hat (MLE)	26.86	Theta star (bias corrected MLE)	30.13
nu hat (MLE)	5.939	nu star (bias corrected)	5.292
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (5.29, α)	1.29	Adjusted Chi Square Value (5.29, β)	0.922
95% Gamma Approximate UCL (use when n>=50)	36.36	95% Gamma Adjusted UCL (use when n<50)	50.83

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	11.34	SD (KM)	6.124
Variance (KM)	37.5	SE of Mean (KM)	2.236
k hat (KM)	3.431	k star (KM)	2.362
nu hat (KM)	61.77	nu star (KM)	42.51
theta hat (KM)	3.306	theta star (KM)	4.803
80% gamma percentile (KM)	16.65	90% gamma percentile (KM)	21.23
95% gamma percentile (KM)	25.55	99% gamma percentile (KM)	35.05

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (42.51, α)	28.56	Adjusted Chi Square Value (42.51, β)	26.17
95% Gamma Approximate KM-UCL (use when n>=50)	16.88	95% Gamma Adjusted KM-UCL (use when n<50)	18.42

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	10.11	Mean in Log Scale	2.101
SD in Original Scale	7.506	SD in Log Scale	0.684
95% t UCL (assumes normality of ROS data)	14.77	95% Percentile Bootstrap UCL	14.21
95% BCA Bootstrap UCL	15.45	95% Bootstrap t UCL	17.94
95% H-UCL (Log ROS)	19.32		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.329	KM Geo Mean	10.26
KM SD (logged)	0.409	95% Critical H Value (KM-Log)	2.143
KM Standard Error of Mean (logged)	0.149	95% H-UCL (KM -Log)	15.21
KM SD (logged)	0.409	95% Critical H Value (KM-Log)	2.143
KM Standard Error of Mean (logged)	0.149		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	10.1	Mean in Log Scale	2.098
SD in Original Scale	7.516	SD in Log Scale	0.687
95% t UCL (Assumes normality)	14.76	95% H-Stat UCL	19.41

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 15.5

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	31.2	Mean	124.6
Maximum	629	Median	37.55
SD	207	Std. Error of Mean	73.2
Coefficient of Variation	1.662	Skewness	2.67

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.53	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	263.2	95% Adjusted-CLT UCL (Chen-1995)	318.8
		95% Modified-t UCL (Johnson-1978)	274.8

Gamma GOF Test

A-D Test Statistic	1.409	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.741	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.373	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.303	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.857	k star (bias corrected MLE)	0.619
Theta hat (MLE)	145.3	Theta star (bias corrected MLE)	201.2
nu hat (MLE)	13.72	nu star (bias corrected)	9.906
MLE Mean (bias corrected)	124.6	MLE Sd (bias corrected)	158.3
		Approximate Chi Square Value (0.05)	3.883
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.99

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	317.8	95% Adjusted Gamma UCL (use when n<50)	412.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.709	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.314	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.44	Mean of logged Data	4.139
Maximum of Logged Data	6.444	SD of logged Data	1.051

Assuming Lognormal Distribution

95% H-UCL	447.6	90% Chebyshev (MVUE) UCL	212.6
95% Chebyshev (MVUE) UCL	263.9	97.5% Chebyshev (MVUE) UCL	335
99% Chebyshev (MVUE) UCL	474.8		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	245	95% Jackknife UCL	263.2
95% Standard Bootstrap UCL	239.6	95% Bootstrap-t UCL	2809
95% Hall's Bootstrap UCL	2343	95% Percentile Bootstrap UCL	259.7
95% BCA Bootstrap UCL	335.3		
90% Chebyshev(Mean, Sd) UCL	344.2	95% Chebyshev(Mean, Sd) UCL	443.6
97.5% Chebyshev(Mean, Sd) UCL	581.7	99% Chebyshev(Mean, Sd) UCL	852.9

Suggested UCL to Use

95% Hall's Bootstrap UCL 2343

Recommended UCL exceeds the maximum observation

In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL

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 (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	66	Mean	107.6
Maximum	161	Median	108.1
SD	28.3	Std. Error of Mean	10.01
Coefficient of Variation	0.263	Skewness	0.609

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	126.5	95% Adjusted-CLT UCL (Chen-1995)	126.3
		95% Modified-t UCL (Johnson-1978)	126.9

Gamma GOF Test

A-D Test Statistic	0.252	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.171	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	16.66	k star (bias corrected MLE)	10.5
Theta hat (MLE)	6.455	Theta star (bias corrected MLE)	10.25
nu hat (MLE)	266.6	nu star (bias corrected)	168
MLE Mean (bias corrected)	107.6	MLE Sd (bias corrected)	33.2
		Approximate Chi Square Value (0.05)	139
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	132.3

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	130	95% Adjusted Gamma UCL (use when n<50)	136.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.19	Mean of logged Data	4.648
Maximum of Logged Data	5.081	SD of logged Data	0.265

Assuming Lognormal Distribution

95% H-UCL	132.2	90% Chebyshev (MVUE) UCL	137.9
95% Chebyshev (MVUE) UCL	151.6	97.5% Chebyshev (MVUE) UCL	170.7
99% Chebyshev (MVUE) UCL	208.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	124	95% Jackknife UCL	126.5
95% Standard Bootstrap UCL	123.1	95% Bootstrap-t UCL	129.7
95% Hall's Bootstrap UCL	134.9	95% Percentile Bootstrap UCL	123.1
95% BCA Bootstrap UCL	124.2		
90% Chebyshev(Mean, Sd) UCL	137.6	95% Chebyshev(Mean, Sd) UCL	151.2
97.5% Chebyshev(Mean, Sd) UCL	170	99% Chebyshev(Mean, Sd) UCL	207.1

Suggested UCL to Use

95% Student's-t UCL 126.5

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 (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	44.1	Mean	234
Maximum	606	Median	186
SD	187.6	Std. Error of Mean	66.34
Coefficient of Variation	0.802	Skewness	1.138

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	359.7	95% Adjusted-CLT UCL (Chen-1995)	371.7
		95% Modified-t UCL (Johnson-1978)	364.2

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.249	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.21	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.768	k star (bias corrected MLE)	1.188
Theta hat (MLE)	132.4	Theta star (bias corrected MLE)	196.9
nu hat (MLE)	28.29	nu star (bias corrected)	19.01
MLE Mean (bias corrected)	234	MLE Sd (bias corrected)	214.7
		Approximate Chi Square Value (0.05)	10.13
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	8.536

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	439.4	95% Adjusted Gamma UCL (use when n<50)	521.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.786	Mean of logged Data	5.147
Maximum of Logged Data	6.407	SD of logged Data	0.878

Assuming Lognormal Distribution

95% H-UCL	713.9	90% Chebyshev (MVUE) UCL	464
95% Chebyshev (MVUE) UCL	566.3	97.5% Chebyshev (MVUE) UCL	708.4
99% Chebyshev (MVUE) UCL	987.5		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	343.2	95% Jackknife UCL	359.7
95% Standard Bootstrap UCL	333.8	95% Bootstrap-t UCL	399.7
95% Hall's Bootstrap UCL	390.4	95% Percentile Bootstrap UCL	340.8
95% BCA Bootstrap UCL	368.7		
90% Chebyshev(Mean, Sd) UCL	433.1	95% Chebyshev(Mean, Sd) UCL	523.2
97.5% Chebyshev(Mean, Sd) UCL	648.3	99% Chebyshev(Mean, Sd) UCL	894.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 359.7

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 (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	31.9	Mean	129.8
Maximum	383	Median	68.6
SD	142.8	Std. Error of Mean	50.48
Coefficient of Variation	1.1	Skewness	1.386

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.708	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.364	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	225.4	95% Adjusted-CLT UCL (Chen-1995)	239.3
		95% Modified-t UCL (Johnson-1978)	229.6

Gamma GOF Test

A-D Test Statistic	0.783	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.28	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.3	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	1.191	k star (bias corrected MLE)	0.828
Theta hat (MLE)	109	Theta star (bias corrected MLE)	156.8
nu hat (MLE)	19.06	nu star (bias corrected)	13.25
MLE Mean (bias corrected)	129.8	MLE Sd (bias corrected)	142.7
		Approximate Chi Square Value (0.05)	6.058
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.885

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	283.8	95% Adjusted Gamma UCL (use when n<50)	352

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.841	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.213	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.463	Mean of logged Data	4.391
Maximum of Logged Data	5.948	SD of logged Data	1

Assuming Lognormal Distribution

95% H-UCL	485.4	90% Chebyshev (MVUE) UCL	255.3
95% Chebyshev (MVUE) UCL	315.5	97.5% Chebyshev (MVUE) UCL	398.9
99% Chebyshev (MVUE) UCL	562.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	212.8	95% Jackknife UCL	225.4
95% Standard Bootstrap UCL	205.9	95% Bootstrap-t UCL	594
95% Hall's Bootstrap UCL	870.1	95% Percentile Bootstrap UCL	209.1
95% BCA Bootstrap UCL	238.1		
90% Chebyshev(Mean, Sd) UCL	281.2	95% Chebyshev(Mean, Sd) UCL	349.8
97.5% Chebyshev(Mean, Sd) UCL	445	99% Chebyshev(Mean, Sd) UCL	632.1

Suggested UCL to Use

95% Adjusted Gamma UCL 352

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

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 (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	44.5	Mean	67.94
Maximum	129	Median	55.8
SD	34.82	Std. Error of Mean	15.57
Coefficient of Variation	0.513	Skewness	2.023

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.364	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	101.1	95% Adjusted-CLT UCL (Chen-1995)	108.6
		95% Modified-t UCL (Johnson-1978)	103.5

Gamma GOF Test

A-D Test Statistic	0.626	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.68	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.331	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	6.248	k star (bias corrected MLE)	2.632
Theta hat (MLE)	10.87	Theta star (bias corrected MLE)	25.81
nu hat (MLE)	62.48	nu star (bias corrected)	26.32
MLE Mean (bias corrected)	67.94	MLE Sd (bias corrected)	41.87
		Approximate Chi Square Value (0.05)	15.63
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	12.18

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	114.4	95% Adjusted Gamma UCL (use when n<50)	146.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.821	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.304	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.795	Mean of logged Data	4.136
Maximum of Logged Data	4.86	SD of logged Data	0.425

Assuming Lognormal Distribution

95% H-UCL	122.1	90% Chebyshev (MVUE) UCL	105.3
95% Chebyshev (MVUE) UCL	122.5	97.5% Chebyshev (MVUE) UCL	146.4
99% Chebyshev (MVUE) UCL	193.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	93.56	95% Jackknife UCL	101.1
95% Standard Bootstrap UCL	90.98	95% Bootstrap-t UCL	187.5
95% Hall's Bootstrap UCL	208.5	95% Percentile Bootstrap UCL	95.92
95% BCA Bootstrap UCL	99.48		
90% Chebyshev(Mean, Sd) UCL	114.7	95% Chebyshev(Mean, Sd) UCL	135.8
97.5% Chebyshev(Mean, Sd) UCL	165.2	99% Chebyshev(Mean, Sd) UCL	222.9

Suggested UCL to Use

95% Adjusted Gamma UCL 146.9

Recommended UCL exceeds the maximum observation

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

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 (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	22.1	Mean	228.7
Maximum	750	Median	130
SD	262.8	Std. Error of Mean	92.91
Coefficient of Variation	1.149	Skewness	1.525

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.755	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.381	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	404.7	95% Adjusted-CLT UCL (Chen-1995)	435.1
		95% Modified-t UCL (Johnson-1978)	413.1

Gamma GOF Test

A-D Test Statistic	0.489	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.282	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.302	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.952	k star (bias corrected MLE)	0.679
Theta hat (MLE)	240.1	Theta star (bias corrected MLE)	337
nu hat (MLE)	15.24	nu star (bias corrected)	10.86
MLE Mean (bias corrected)	228.7	MLE Sd (bias corrected)	277.6
		Approximate Chi Square Value (0.05)	4.484

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	3.507

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	553.7	95% Adjusted Gamma UCL (use when n<50)	708

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.21	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.096	Mean of logged Data	4.823
Maximum of Logged Data	6.62	SD of logged Data	1.244

Assuming Lognormal Distribution

95% H-UCL	1809	90% Chebyshev (MVUE) UCL	548.4
95% Chebyshev (MVUE) UCL	690.8	97.5% Chebyshev (MVUE) UCL	888.5
99% Chebyshev (MVUE) UCL	1277		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	381.5	95% Jackknife UCL	404.7
95% Standard Bootstrap UCL	371.1	95% Bootstrap-t UCL	933.8
95% Hall's Bootstrap UCL	1754	95% Percentile Bootstrap UCL	380.3
95% BCA Bootstrap UCL	418.9		
90% Chebyshev(Mean, Sd) UCL	507.4	95% Chebyshev(Mean, Sd) UCL	633.7
97.5% Chebyshev(Mean, Sd) UCL	808.9	99% Chebyshev(Mean, Sd) UCL	1153

Suggested UCL to Use

95% Adjusted Gamma UCL 708

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Copper (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	24.3	Mean	51.76
Maximum	120	Median	44.85
SD	28.65	Std. Error of Mean	10.13
Coefficient of Variation	0.554	Skewness	2.38

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.664	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.415	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	70.95	95% Adjusted-CLT UCL (Chen-1995)	77.53
		95% Modified-t UCL (Johnson-1978)	72.37

Gamma GOF Test

A-D Test Statistic	0.999	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.719	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.369	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.295	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.324	k star (bias corrected MLE)	3.411
Theta hat (MLE)	9.722	Theta star (bias corrected MLE)	15.17
nu hat (MLE)	85.19	nu star (bias corrected)	54.58
MLE Mean (bias corrected)	51.76	MLE Sd (bias corrected)	28.03
		Approximate Chi Square Value (0.05)	38.6
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	35.23

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	73.18	95% Adjusted Gamma UCL (use when n<50)	80.18

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.817	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.339	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.19	Mean of logged Data	3.85
Maximum of Logged Data	4.787	SD of logged Data	0.44

Assuming Lognormal Distribution

95% H-UCL	75.36	90% Chebyshev (MVUE) UCL	75.16
95% Chebyshev (MVUE) UCL	86.06	97.5% Chebyshev (MVUE) UCL	101.2
99% Chebyshev (MVUE) UCL	130.9		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	68.42	95% Jackknife UCL	70.95
95% Standard Bootstrap UCL	67.05	95% Bootstrap-t UCL	117.9
95% Hall's Bootstrap UCL	156.7	95% Percentile Bootstrap UCL	70.96
95% BCA Bootstrap UCL	74.04		
90% Chebyshev(Mean, Sd) UCL	82.15	95% Chebyshev(Mean, Sd) UCL	95.92
97.5% Chebyshev(Mean, Sd) UCL	115	99% Chebyshev(Mean, Sd) UCL	152.6

Suggested UCL to Use

95% Student's-t UCL	70.95	or 95% Modified-t UCL	72.37

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 (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	5.77	Mean	27.85
Maximum	52	Median	26.5
SD	13.36	Std. Error of Mean	4.723
Coefficient of Variation	0.48	Skewness	0.314

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	36.79	95% Adjusted-CLT UCL (Chen-1995)	36.18
		95% Modified-t UCL (Johnson-1978)	36.88

Gamma GOF Test

A-D Test Statistic	0.473	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.719	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.276	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.296	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.685	k star (bias corrected MLE)	2.387
Theta hat (MLE)	7.556	Theta star (bias corrected MLE)	11.67
nu hat (MLE)	58.96	nu star (bias corrected)	38.18
MLE Mean (bias corrected)	27.85	MLE Sd (bias corrected)	18.03
		Approximate Chi Square Value (0.05)	25.03
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	22.38

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	42.47	95% Adjusted Gamma UCL (use when n<50)	47.52

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.831	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.753	Mean of logged Data	3.185
Maximum of Logged Data	3.951	SD of logged Data	0.646

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	56.54	90% Chebyshev (MVUE) UCL	49.02
95% Chebyshev (MVUE) UCL	58.13	97.5% Chebyshev (MVUE) UCL	70.77
99% Chebyshev (MVUE) UCL	95.61		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	35.62	95% Jackknife UCL	36.79
95% Standard Bootstrap UCL	35.19	95% Bootstrap-t UCL	38.28
95% Hall's Bootstrap UCL	42.7	95% Percentile Bootstrap UCL	35.17
95% BCA Bootstrap UCL	35.71		
90% Chebyshev(Mean, Sd) UCL	42.02	95% Chebyshev(Mean, Sd) UCL	48.43
97.5% Chebyshev(Mean, Sd) UCL	57.34	99% Chebyshev(Mean, Sd) UCL	74.84

Suggested UCL to Use

95% Student's-t UCL 36.79

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 (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	11	Mean	22.83
Maximum	39.5	Median	19.9
SD	9.826	Std. Error of Mean	3.275
Coefficient of Variation	0.43	Skewness	0.818

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	28.92	95% Adjusted-CLT UCL (Chen-1995)	29.17
		95% Modified-t UCL (Johnson-1978)	29.07

Gamma GOF Test

A-D Test Statistic	0.271	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.152	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.402	k star (bias corrected MLE)	4.342
Theta hat (MLE)	3.567	Theta star (bias corrected MLE)	5.259
nu hat (MLE)	115.2	nu star (bias corrected)	78.15
MLE Mean (bias corrected)	22.83	MLE Sd (bias corrected)	10.96
		Approximate Chi Square Value (0.05)	58.79
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	55.26

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	30.36	95% Adjusted Gamma UCL (use when n<50)	32.29

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.136	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.398	Mean of logged Data	3.048
Maximum of Logged Data	3.676	SD of logged Data	0.425

Assuming Lognormal Distribution

95% H-UCL	31.89	90% Chebyshev (MVUE) UCL	32.61
95% Chebyshev (MVUE) UCL	37.05	97.5% Chebyshev (MVUE) UCL	43.2
99% Chebyshev (MVUE) UCL	55.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	28.22	95% Jackknife UCL	28.92
95% Standard Bootstrap UCL	27.97	95% Bootstrap-t UCL	32.09
95% Hall's Bootstrap UCL	38.21	95% Percentile Bootstrap UCL	27.92
95% BCA Bootstrap UCL	28.28		
90% Chebyshev(Mean, Sd) UCL	32.66	95% Chebyshev(Mean, Sd) UCL	37.11
97.5% Chebyshev(Mean, Sd) UCL	43.29	99% Chebyshev(Mean, Sd) UCL	55.42

Suggested UCL to Use

95% Student's-t UCL 28.92

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.

Lead (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	37.1	Mean	380.9
Maximum	1540	Median	119.4
SD	523.3	Std. Error of Mean	185
Coefficient of Variation	1.374	Skewness	1.932

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.725	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.298	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	731.4	95% Adjusted-CLT UCL (Chen-1995)	820.2
		95% Modified-t UCL (Johnson-1978)	752.5

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.475	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.247	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.755	k star (bias corrected MLE)	0.555
Theta hat (MLE)	504.8	Theta star (bias corrected MLE)	686.3
nu hat (MLE)	12.07	nu star (bias corrected)	8.88
MLE Mean (bias corrected)	380.9	MLE Sd (bias corrected)	511.3
		Approximate Chi Square Value (0.05)	3.254
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.455

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1039	95% Adjusted Gamma UCL (use when n<50)	1378

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.178	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.614	Mean of logged Data	5.15
Maximum of Logged Data	7.34	SD of logged Data	1.344

Assuming Lognormal Distribution

95% H-UCL	3808	90% Chebyshev (MVUE) UCL	876.3
95% Chebyshev (MVUE) UCL	1111	97.5% Chebyshev (MVUE) UCL	1437
99% Chebyshev (MVUE) UCL	2076		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	685.2	95% Jackknife UCL	731.4
95% Standard Bootstrap UCL	657.1	95% Bootstrap-t UCL	1551
95% Hall's Bootstrap UCL	1878	95% Percentile Bootstrap UCL	700.2
95% BCA Bootstrap UCL	796.9		
90% Chebyshev(Mean, Sd) UCL	935.9	95% Chebyshev(Mean, Sd) UCL	1187
97.5% Chebyshev(Mean, Sd) UCL	1536	99% Chebyshev(Mean, Sd) UCL	2222

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Adjusted Gamma UCL 1378

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.

Lead (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	98.5	Mean	245.2
Maximum	486	Median	218.5
SD	146.1	Std. Error of Mean	51.66
Coefficient of Variation	0.596	Skewness	0.654

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	343.1	95% Adjusted-CLT UCL (Chen-1995)	342.9
		95% Modified-t UCL (Johnson-1978)	345

Gamma GOF Test

A-D Test Statistic	0.316	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.185	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.296	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	3.206	k star (bias corrected MLE)	2.087
Theta hat (MLE)	76.47	Theta star (bias corrected MLE)	117.5
nu hat (MLE)	51.3	nu star (bias corrected)	33.4
MLE Mean (bias corrected)	245.2	MLE Sd (bias corrected)	169.7
		Approximate Chi Square Value (0.05)	21.18
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	18.76

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	386.6	95% Adjusted Gamma UCL (use when n<50)	436.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.165	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.59	Mean of logged Data	5.338
Maximum of Logged Data	6.186	SD of logged Data	0.622

Assuming Lognormal Distribution

95% H-UCL	462.4	90% Chebyshev (MVUE) UCL	409.9
95% Chebyshev (MVUE) UCL	484.3	97.5% Chebyshev (MVUE) UCL	587.6
99% Chebyshev (MVUE) UCL	790.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	330.2	95% Jackknife UCL	343.1
95% Standard Bootstrap UCL	324.2	95% Bootstrap-t UCL	382.6
95% Hall's Bootstrap UCL	351.4	95% Percentile Bootstrap UCL	325
95% BCA Bootstrap UCL	331.4		
90% Chebyshev(Mean, Sd) UCL	400.2	95% Chebyshev(Mean, Sd) UCL	470.4
97.5% Chebyshev(Mean, Sd) UCL	567.8	99% Chebyshev(Mean, Sd) UCL	759.2

Suggested UCL to Use

95% Student's-t UCL 343.1

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lead (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	22.6	Mean	784.3
Maximum	2550	Median	444
SD	875.2	Std. Error of Mean	309.4
Coefficient of Variation	1.116	Skewness	1.29

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.838	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	1371	95% Adjusted-CLT UCL (Chen-1995)	1444
		95% Modified-t UCL (Johnson-1978)	1394

Gamma GOF Test

A-D Test Statistic	0.313	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.229	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.747	k star (bias corrected MLE)	0.55
Theta hat (MLE)	1050	Theta star (bias corrected MLE)	1425
nu hat (MLE)	11.96	nu star (bias corrected)	8.806
MLE Mean (bias corrected)	784.3	MLE Sd (bias corrected)	1057
		Approximate Chi Square Value (0.05)	3.21
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.418

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2152	95% Adjusted Gamma UCL (use when n<50)	2857

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.118	Mean of logged Data	5.863
Maximum of Logged Data	7.844	SD of logged Data	1.574

Assuming Lognormal Distribution

95% H-UCL	22990	90% Chebyshev (MVUE) UCL	2503
95% Chebyshev (MVUE) UCL	3213	97.5% Chebyshev (MVUE) UCL	4198
99% Chebyshev (MVUE) UCL	6132		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1293	95% Jackknife UCL	1371
95% Standard Bootstrap UCL	1274	95% Bootstrap-t UCL	1649
95% Hall's Bootstrap UCL	1465	95% Percentile Bootstrap UCL	1278
95% BCA Bootstrap UCL	1384		
90% Chebyshev(Mean, Sd) UCL	1713	95% Chebyshev(Mean, Sd) UCL	2133
97.5% Chebyshev(Mean, Sd) UCL	2717	99% Chebyshev(Mean, Sd) UCL	3863

Suggested UCL to Use

95% Student's-t UCL 1371

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.

Lead (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	183	Mean	2429
Maximum	13400	Median	884
SD	4503	Std. Error of Mean	1592
Coefficient of Variation	1.854	Skewness	2.666

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.558	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.373	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	5445	95% Adjusted-CLT UCL (Chen-1995)	6651
		95% Modified-t UCL (Johnson-1978)	5695

Gamma GOF Test

A-D Test Statistic	0.725	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.298	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.307	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.585	k star (bias corrected MLE)	0.449
Theta hat (MLE)	4150	Theta star (bias corrected MLE)	5408
nu hat (MLE)	9.365	nu star (bias corrected)	7.186
MLE Mean (bias corrected)	2429	MLE Sd (bias corrected)	3624
		Approximate Chi Square Value (0.05)	2.273
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	1.639

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	7678	95% Adjusted Gamma UCL (use when n<50)	10647

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.198	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.209	Mean of logged Data	6.736
Maximum of Logged Data	9.503	SD of logged Data	1.459

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	31365	90% Chebyshev (MVUE) UCL	5057
95% Chebyshev (MVUE) UCL	6453	97.5% Chebyshev (MVUE) UCL	8391
99% Chebyshev (MVUE) UCL	12198		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5047	95% Jackknife UCL	5445
95% Standard Bootstrap UCL	4832	95% Bootstrap-t UCL	24544
95% Hall's Bootstrap UCL	18945	95% Percentile Bootstrap UCL	5410
95% BCA Bootstrap UCL	6804		
90% Chebyshev(Mean, Sd) UCL	7205	95% Chebyshev(Mean, Sd) UCL	9368
97.5% Chebyshev(Mean, Sd) UCL	12370	99% Chebyshev(Mean, Sd) UCL	18268

Suggested UCL to Use

95% Adjusted Gamma UCL 10647

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.

Lead (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	71.1	Mean	374.8
Maximum	1030	Median	273
SD	391.3	Std. Error of Mean	175
Coefficient of Variation	1.044	Skewness	1.599

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	747.8	95% Adjusted-CLT UCL (Chen-1995)	796.3
		95% Modified-t UCL (Johnson-1978)	768.7

Gamma GOF Test

A-D Test Statistic	0.281	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.225	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.236	k star (bias corrected MLE)	0.628
Theta hat (MLE)	303.3	Theta star (bias corrected MLE)	597.1
nu hat (MLE)	12.36	nu star (bias corrected)	6.277
MLE Mean (bias corrected)	374.8	MLE Sd (bias corrected)	473.1
		Approximate Chi Square Value (0.05)	1.783
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.928

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1319	95% Adjusted Gamma UCL (use when n<50)	2534

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.204	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.264	Mean of logged Data	5.47
Maximum of Logged Data	6.937	SD of logged Data	1.095

Assuming Lognormal Distribution

95% H-UCL	7966	90% Chebyshev (MVUE) UCL	889.2
95% Chebyshev (MVUE) UCL	1124	97.5% Chebyshev (MVUE) UCL	1449
99% Chebyshev (MVUE) UCL	2089		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	662.6	95% Jackknife UCL	747.8
95% Standard Bootstrap UCL	632.9	95% Bootstrap-t UCL	1188
95% Hall's Bootstrap UCL	1876	95% Percentile Bootstrap UCL	650.8
95% BCA Bootstrap UCL	718		
90% Chebyshev(Mean, Sd) UCL	899.8	95% Chebyshev(Mean, Sd) UCL	1138
97.5% Chebyshev(Mean, Sd) UCL	1468	99% Chebyshev(Mean, Sd) UCL	2116

Suggested UCL to Use

95% Student's-t UCL 747.8

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.

Lead (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	51.4	Mean	10230
Maximum	65600	Median	1830
SD	22532	Std. Error of Mean	7966
Coefficient of Variation	2.203	Skewness	2.752

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.516	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.411	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	25323	95% Adjusted-CLT UCL (Chen-1995)	31615
		95% Modified-t UCL (Johnson-1978)	26615

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.465	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.789	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.219	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.315	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.346	k star (bias corrected MLE)	0.299
Theta hat (MLE)	29581	Theta star (bias corrected MLE)	34160
nu hat (MLE)	5.533	nu star (bias corrected)	4.792
MLE Mean (bias corrected)	10230	MLE Sd (bias corrected)	18694
		Approximate Chi Square Value (0.05)	1.057
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.684

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	46369	95% Adjusted Gamma UCL (use when n<50)	71676

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.982	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.94	Mean of logged Data	7.285
Maximum of Logged Data	11.09	SD of logged Data	2.299

Assuming Lognormal Distribution

95% H-UCL	8842981	90% Chebyshev (MVUE) UCL	32246
95% Chebyshev (MVUE) UCL	42356	97.5% Chebyshev (MVUE) UCL	56389
99% Chebyshev (MVUE) UCL	83953		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	23334	95% Jackknife UCL	25323
95% Standard Bootstrap UCL	22322	95% Bootstrap-t UCL	163413
95% Hall's Bootstrap UCL	92121	95% Percentile Bootstrap UCL	25519
95% BCA Bootstrap UCL	33952		
90% Chebyshev(Mean, Sd) UCL	34130	95% Chebyshev(Mean, Sd) UCL	44955
97.5% Chebyshev(Mean, Sd) UCL	59981	99% Chebyshev(Mean, Sd) UCL	89495

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Adjusted Gamma UCL 71676

Recommended UCL exceeds the maximum observation

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.

Lead (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	327	Mean	11139
Maximum	78400	Median	1173
SD	27228	Std. Error of Mean	9627
Coefficient of Variation	2.444	Skewness	2.808

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.465	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.46	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	29377	95% Adjusted-CLT UCL (Chen-1995)	37185
		95% Modified-t UCL (Johnson-1978)	30970

Gamma GOF Test

A-D Test Statistic	1.179	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.789	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.337	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.315	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	0.348	k star (bias corrected MLE)	0.301
Theta hat (MLE)	32050	Theta star (bias corrected MLE)	37062
nu hat (MLE)	5.561	nu star (bias corrected)	4.809
MLE Mean (bias corrected)	11139	MLE Sd (bias corrected)	20318
		Approximate Chi Square Value (0.05)	1.065
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.69

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	50301	95% Adjusted Gamma UCL (use when n<50)	77672

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.837	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.215	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.79	Mean of logged Data	7.381
Maximum of Logged Data	11.27	SD of logged Data	1.85

Assuming Lognormal Distribution

95% H-UCL	483048	90% Chebyshev (MVUE) UCL	17386
95% Chebyshev (MVUE) UCL	22562	97.5% Chebyshev (MVUE) UCL	29747
99% Chebyshev (MVUE) UCL	43858		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	26973	95% Jackknife UCL	29377
95% Standard Bootstrap UCL	25962	95% Bootstrap-t UCL	417242
95% Hall's Bootstrap UCL	172059	95% Percentile Bootstrap UCL	29984
95% BCA Bootstrap UCL	40363		
90% Chebyshev(Mean, Sd) UCL	40019	95% Chebyshev(Mean, Sd) UCL	53101
97.5% Chebyshev(Mean, Sd) UCL	71257	99% Chebyshev(Mean, Sd) UCL	106923

Suggested UCL to Use

99% Chebyshev (Mean, Sd) UCL 106923

Recommended UCL exceeds the maximum observation

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).

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Lead (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	49.7	Mean	285.6
Maximum	997	Median	216
SD	299.8	Std. Error of Mean	106
Coefficient of Variation	1.05	Skewness	2.376

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.693	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.362	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	486.3	95% Adjusted-CLT UCL (Chen-1995)	555
		95% Modified-t UCL (Johnson-1978)	501.2

Gamma GOF Test

A-D Test Statistic	0.436	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.252	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.299	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.524	k star (bias corrected MLE)	1.036
Theta hat (MLE)	187.3	Theta star (bias corrected MLE)	275.6
nu hat (MLE)	24.39	nu star (bias corrected)	16.58
MLE Mean (bias corrected)	285.6	MLE Sd (bias corrected)	280.5
		Approximate Chi Square Value (0.05)	8.371
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	6.948

Assuming Gamma Distribution

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

95% Approximate Gamma UCL (use when n>=50)	565.5	95% Adjusted Gamma UCL (use when n<50)	681.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.204	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.906	Mean of logged Data	5.292
Maximum of Logged Data	6.905	SD of logged Data	0.892

Assuming Lognormal Distribution

95% H-UCL	860.5	90% Chebyshev (MVUE) UCL	546.5
95% Chebyshev (MVUE) UCL	668.1	97.5% Chebyshev (MVUE) UCL	836.9
99% Chebyshev (MVUE) UCL	1168		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	459.9	95% Jackknife UCL	486.3
95% Standard Bootstrap UCL	448	95% Bootstrap-t UCL	776.8
95% Hall's Bootstrap UCL	1214	95% Percentile Bootstrap UCL	472.6
95% BCA Bootstrap UCL	566.9		
90% Chebyshev(Mean, Sd) UCL	603.5	95% Chebyshev(Mean, Sd) UCL	747.5
97.5% Chebyshev(Mean, Sd) UCL	947.4	99% Chebyshev(Mean, Sd) UCL	1340

Suggested UCL to Use

95% Adjusted Gamma UCL	681.3

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.

Lead (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	33.7	Mean	166.2
Maximum	399	Median	120
SD	133.7	Std. Error of Mean	44.58

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Coefficient of Variation	0.805	Skewness	0.949

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.256	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	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	249.1	95% Adjusted-CLT UCL (Chen-1995)	254.6
		95% Modified-t UCL (Johnson-1978)	251.4

Gamma GOF Test

A-D Test Statistic	0.273	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.166	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.283	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.757	k star (bias corrected MLE)	1.245
Theta hat (MLE)	94.6	Theta star (bias corrected MLE)	133.5
nu hat (MLE)	31.62	nu star (bias corrected)	22.41
MLE Mean (bias corrected)	166.2	MLE Sd (bias corrected)	148.9
		Approximate Chi Square Value (0.05)	12.65
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	11.13

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	294.5	95% Adjusted Gamma UCL (use when n<50)	334.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.116	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.517	Mean of logged Data	4.802
Maximum of Logged Data	5.989	SD of logged Data	0.863

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	434.1	90% Chebyshev (MVUE) UCL	317.3
95% Chebyshev (MVUE) UCL	385	97.5% Chebyshev (MVUE) UCL	479
99% Chebyshev (MVUE) UCL	663.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	239.5	95% Jackknife UCL	249.1
95% Standard Bootstrap UCL	237	95% Bootstrap-t UCL	302.2
95% Hall's Bootstrap UCL	274.4	95% Percentile Bootstrap UCL	235.5
95% BCA Bootstrap UCL	244		
90% Chebyshev(Mean, Sd) UCL	299.9	95% Chebyshev(Mean, Sd) UCL	360.5
97.5% Chebyshev(Mean, Sd) UCL	444.6	99% Chebyshev(Mean, Sd) UCL	609.7

Suggested UCL to Use

95% Student's-t UCL 249.1

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.

Zinc (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	106	Mean	342.5
Maximum	767	Median	246
SD	270.5	Std. Error of Mean	95.63
Coefficient of Variation	0.79	Skewness	0.942

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.796	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.272	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	523.7	95% Adjusted-CLT UCL (Chen-1995)	533.8
		95% Modified-t UCL (Johnson-1978)	529

Gamma GOF Test

A-D Test Statistic	0.651	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.297	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.963	k star (bias corrected MLE)	1.31
Theta hat (MLE)	174.5	Theta star (bias corrected MLE)	261.4
nu hat (MLE)	31.4	nu star (bias corrected)	20.96
MLE Mean (bias corrected)	342.5	MLE Sd (bias corrected)	299.2
		Approximate Chi Square Value (0.05)	11.56
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	9.844

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	620.9	95% Adjusted Gamma UCL (use when n<50)	729.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.28	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.663	Mean of logged Data	5.56
Maximum of Logged Data	6.642	SD of logged Data	0.793

Assuming Lognormal Distribution

95% H-UCL	858	90% Chebyshev (MVUE) UCL	630.4
95% Chebyshev (MVUE) UCL	762.1	97.5% Chebyshev (MVUE) UCL	944.9
99% Chebyshev (MVUE) UCL	1304		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	499.8	95% Jackknife UCL	523.7
95% Standard Bootstrap UCL	484.1	95% Bootstrap-t UCL	629.8
95% Hall's Bootstrap UCL	674.2	95% Percentile Bootstrap UCL	494.9
95% BCA Bootstrap UCL	528.6		
90% Chebyshev(Mean, Sd) UCL	629.4	95% Chebyshev(Mean, Sd) UCL	759.3
97.5% Chebyshev(Mean, Sd) UCL	939.7	99% Chebyshev(Mean, Sd) UCL	1294

Suggested UCL to Use

95% Student's-t UCL 523.7

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Zinc (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	134	Mean	348
Maximum	524	Median	377.5
SD	157.7	Std. Error of Mean	55.76
Coefficient of Variation	0.453	Skewness	-0.343

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	453.6	95% Adjusted-CLT UCL (Chen-1995)	432.5
		95% Modified-t UCL (Johnson-1978)	452.5

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.526	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.719	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.259	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.295	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.478	k star (bias corrected MLE)	2.882
Theta hat (MLE)	77.72	Theta star (bias corrected MLE)	120.8
nu hat (MLE)	71.64	nu star (bias corrected)	46.11
MLE Mean (bias corrected)	348	MLE Sd (bias corrected)	205
		Approximate Chi Square Value (0.05)	31.53
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	28.51

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	508.9	95% Adjusted Gamma UCL (use when n<50)	562.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.851	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.246	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.898	Mean of logged Data	5.736
Maximum of Logged Data	6.261	SD of logged Data	0.549

Assuming Lognormal Distribution

95% H-UCL	597.4	90% Chebyshev (MVUE) UCL	560.6
95% Chebyshev (MVUE) UCL	654.7	97.5% Chebyshev (MVUE) UCL	785.3
99% Chebyshev (MVUE) UCL	1042		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	439.7	95% Jackknife UCL	453.6
95% Standard Bootstrap UCL	436.1	95% Bootstrap-t UCL	453.1
95% Hall's Bootstrap UCL	419.8	95% Percentile Bootstrap UCL	433.8
95% BCA Bootstrap UCL	428.5		
90% Chebyshev(Mean, Sd) UCL	515.3	95% Chebyshev(Mean, Sd) UCL	591.1
97.5% Chebyshev(Mean, Sd) UCL	696.2	99% Chebyshev(Mean, Sd) UCL	902.8

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 453.6

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.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Zinc (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	201	Minimum Non-Detect	96.5
Maximum Detect	919	Maximum Non-Detect	111
Variance Detects	87173	Percent Non-Detects	25%
Mean Detects	558.8	SD Detects	295.3
Median Detects	487	CV Detects	0.528
Skewness Detects	0.348	Kurtosis Detects	-1.738
Mean of Logged Detects	6.194	SD of Logged Detects	0.584

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.21	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	443.3	KM Standard Error of Mean	119.1
KM SD	307.5	95% KM (BCA) UCL	632.2
95% KM (t) UCL	668.9	95% KM (Percentile Bootstrap) UCL	634.3
95% KM (z) UCL	639.1	95% KM Bootstrap t UCL	724
90% KM Chebyshev UCL	800.5	95% KM Chebyshev UCL	962.4
97.5% KM Chebyshev UCL	1187	99% KM Chebyshev UCL	1628

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.287	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.217	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.334	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)	3.956	k star (bias corrected MLE)	2.089
Theta hat (MLE)	141.3	Theta star (bias corrected MLE)	267.5
nu hat (MLE)	47.47	nu star (bias corrected)	25.07
Mean (detects)	558.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	419.1
Maximum	919	Median	386.5
SD	359.4	CV	0.858
k hat (MLE)	0.275	k star (bias corrected MLE)	0.255
Theta hat (MLE)	1524	Theta star (bias corrected MLE)	1642
nu hat (MLE)	4.399	nu star (bias corrected)	4.083
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.08, α)	0.755	Adjusted Chi Square Value (4.08, β)	0.465
95% Gamma Approximate UCL (use when n>=50)	2267	95% Gamma Adjusted UCL (use when n<50)	3679

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	443.3	SD (KM)	307.5
Variance (KM)	94562	SE of Mean (KM)	119.1
k hat (KM)	2.078	k star (KM)	1.382
nu hat (KM)	33.24	nu star (KM)	22.11
theta hat (KM)	213.3	theta star (KM)	320.8
80% gamma percentile (KM)	691.9	90% gamma percentile (KM)	942.4
95% gamma percentile (KM)	1187	99% gamma percentile (KM)	1742

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.11, α)	12.42	Adjusted Chi Square Value (22.11, β)	10.63
95% Gamma Approximate KM-UCL (use when n>=50)	789	95% Gamma Adjusted KM-UCL (use when n<50)	921.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.185	**Lilliefors GOF Test**

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

5% Lilliefors Critical Value	0.325	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	448	Mean in Log Scale	5.833
SD in Original Scale	323.1	SD in Log Scale	0.831
95% t UCL (assumes normality of ROS data)	664.4	95% Percentile Bootstrap UCL	625.8
95% BCA Bootstrap UCL	651.7	95% Bootstrap t UCL	717.2
95% H-UCL (Log ROS)	1246		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.788	KM Geo Mean	326.4
KM SD (logged)	0.841	95% Critical H Value (KM-Log)	3.046
KM Standard Error of Mean (logged)	0.326	95% H-UCL (KM -Log)	1225
KM SD (logged)	0.841	95% Critical H Value (KM-Log)	3.046
KM Standard Error of Mean (logged)	0.326		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	432.1	Mean in Log Scale	5.632
SD in Original Scale	342.6	SD in Log Scale	1.152
95% t UCL (Assumes normality)	661.5	95% H-Stat UCL	2851

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 668.9

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.

Zinc (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	605	Mean	766.3
Maximum	1000	Median	701
SD	157.6	Std. Error of Mean	55.71
Coefficient of Variation	0.206	Skewness	0.565

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.283	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data Not 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	871.8	95% Adjusted-CLT UCL (Chen-1995)	869.8
		95% Modified-t UCL (Johnson-1978)	873.7

Gamma GOF Test

A-D Test Statistic	0.559	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.278	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	28.09	k star (bias corrected MLE)	17.64
Theta hat (MLE)	27.28	Theta star (bias corrected MLE)	43.44
nu hat (MLE)	449.4	nu star (bias corrected)	282.2
MLE Mean (bias corrected)	766.3	MLE Sd (bias corrected)	182.4
		Approximate Chi Square Value (0.05)	244.3
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	235.4

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	885.1	95% Adjusted Gamma UCL (use when n<50)	918.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.261	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.405	Mean of logged Data	6.624
Maximum of Logged Data	6.908	SD of logged Data	0.201

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	889.9	90% Chebyshev (MVUE) UCL	929.3
95% Chebyshev (MVUE) UCL	1003	97.5% Chebyshev (MVUE) UCL	1106
99% Chebyshev (MVUE) UCL	1307		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	857.9	95% Jackknife UCL	871.8
95% Standard Bootstrap UCL	852.8	95% Bootstrap-t UCL	894.3
95% Hall's Bootstrap UCL	843.7	95% Percentile Bootstrap UCL	849.3
95% BCA Bootstrap UCL	864.9		
90% Chebyshev(Mean, Sd) UCL	933.4	95% Chebyshev(Mean, Sd) UCL	1009
97.5% Chebyshev(Mean, Sd) UCL	1114	99% Chebyshev(Mean, Sd) UCL	1321

Suggested UCL to Use

95% Student's-t UCL 871.8

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Zinc (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	101	Mean	286.8
Maximum	677	Median	173
SD	231.6	Std. Error of Mean	103.6
Coefficient of Variation	0.808	Skewness	1.672

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.815	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	507.6	95% Adjusted-CLT UCL (Chen-1995)	539.9
		95% Modified-t UCL (Johnson-1978)	520.6

Gamma GOF Test

A-D Test Statistic	0.37	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.288	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.363	k star (bias corrected MLE)	1.079
Theta hat (MLE)	121.4	Theta star (bias corrected MLE)	265.9
nu hat (MLE)	23.63	nu star (bias corrected)	10.79
MLE Mean (bias corrected)	286.8	MLE Sd (bias corrected)	276.2
		Approximate Chi Square Value (0.05)	4.439
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	2.845

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	696.9	95% Adjusted Gamma UCL (use when n<50)	1087

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.249	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.615	Mean of logged Data	5.433
Maximum of Logged Data	6.518	SD of logged Data	0.728

Assuming Lognormal Distribution

95% H-UCL	1178	90% Chebyshev (MVUE) UCL	549.5
95% Chebyshev (MVUE) UCL	671.3	97.5% Chebyshev (MVUE) UCL	840.2
99% Chebyshev (MVUE) UCL	1172		

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	457.2	95% Jackknife UCL	507.6
95% Standard Bootstrap UCL	436.9	95% Bootstrap-t UCL	1206
95% Hall's Bootstrap UCL	1629	95% Percentile Bootstrap UCL	460
95% BCA Bootstrap UCL	474.4		
90% Chebyshev(Mean, Sd) UCL	597.6	95% Chebyshev(Mean, Sd) UCL	738.4
97.5% Chebyshev(Mean, Sd) UCL	933.7	99% Chebyshev(Mean, Sd) UCL	1318

Suggested UCL to Use

95% Student's-t UCL 507.6

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.

Zinc (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	126	Mean	507
Maximum	1490	Median	199.5
SD	561.9	Std. Error of Mean	198.7
Coefficient of Variation	1.108	Skewness	1.386

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.69	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.332	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	883.4	95% Adjusted-CLT UCL (Chen-1995)	937.8
		95% Modified-t UCL (Johnson-1978)	899.6

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.95	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.324	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.3	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.207	k star (bias corrected MLE)	0.838
Theta hat (MLE)	420.1	Theta star (bias corrected MLE)	605.2
nu hat (MLE)	19.31	nu star (bias corrected)	13.4
MLE Mean (bias corrected)	507	MLE Sd (bias corrected)	553.9
		Approximate Chi Square Value (0.05)	6.165
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.979

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1102	95% Adjusted Gamma UCL (use when n<50)	1365

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.815	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.289	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.836	Mean of logged Data	5.76
Maximum of Logged Data	7.307	SD of logged Data	0.976

Assuming Lognormal Distribution

95% H-UCL	1770	90% Chebyshev (MVUE) UCL	973.3
95% Chebyshev (MVUE) UCL	1200	97.5% Chebyshev (MVUE) UCL	1514
99% Chebyshev (MVUE) UCL	2132		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	833.8	95% Jackknife UCL	883.4
95% Standard Bootstrap UCL	821.2	95% Bootstrap-t UCL	2597
95% Hall's Bootstrap UCL	3151	95% Percentile Bootstrap UCL	827.8
95% BCA Bootstrap UCL	922		
90% Chebyshev(Mean, Sd) UCL	1103	95% Chebyshev(Mean, Sd) UCL	1373
97.5% Chebyshev(Mean, Sd) UCL	1748	99% Chebyshev(Mean, Sd) UCL	2484

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1373

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.

Zinc (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	93.9	Mean	342
Maximum	780	Median	243.5
SD	229.5	Std. Error of Mean	81.13
Coefficient of Variation	0.671	Skewness	1.215

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.862	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.289	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data Not 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	495.7	95% Adjusted-CLT UCL (Chen-1995)	512.7
		95% Modified-t UCL (Johnson-1978)	501.5

Gamma GOF Test

A-D Test Statistic	0.363	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.252	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.297	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	2.801	k star (bias corrected MLE)	1.834
Theta hat (MLE)	122.1	Theta star (bias corrected MLE)	186.5
nu hat (MLE)	44.82	nu star (bias corrected)	29.35
MLE Mean (bias corrected)	342	MLE Sd (bias corrected)	252.5
		Approximate Chi Square Value (0.05)	17.98
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	15.77

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	558.2	95% Adjusted Gamma UCL (use when n<50)	636.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.211	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.542	Mean of logged Data	5.646
Maximum of Logged Data	6.659	SD of logged Data	0.663

Assuming Lognormal Distribution

95% H-UCL	686.7	90% Chebyshev (MVUE) UCL	585.8
95% Chebyshev (MVUE) UCL	696.4	97.5% Chebyshev (MVUE) UCL	849.8
99% Chebyshev (MVUE) UCL	1151		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	475.4	95% Jackknife UCL	495.7
95% Standard Bootstrap UCL	468.8	95% Bootstrap-t UCL	684.6
95% Hall's Bootstrap UCL	1356	95% Percentile Bootstrap UCL	473.8
95% BCA Bootstrap UCL	499.6		
90% Chebyshev(Mean, Sd) UCL	585.4	95% Chebyshev(Mean, Sd) UCL	695.6
97.5% Chebyshev(Mean, Sd) UCL	848.6	99% Chebyshev(Mean, Sd) UCL	1149

Suggested UCL to Use

95% Student's-t UCL 495.7

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

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.

Zinc (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	63.6	Mean	232
Maximum	554	Median	161.5
SD	198	Std. Error of Mean	70.01
Coefficient of Variation	0.853	Skewness	1.204

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.768	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.33	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	364.7	95% Adjusted-CLT UCL (Chen-1995)	379
		95% Modified-t UCL (Johnson-1978)	369.6

Gamma GOF Test

A-D Test Statistic	0.533	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.248	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.818	k star (bias corrected MLE)	1.219
Theta hat (MLE)	127.7	Theta star (bias corrected MLE)	190.3
nu hat (MLE)	29.08	nu star (bias corrected)	19.51
MLE Mean (bias corrected)	232	MLE Sd (bias corrected)	210.1
		Approximate Chi Square Value (0.05)	10.49

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	8.867

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	431.5	95% Adjusted Gamma UCL (use when n<50)	510.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.196	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.153	Mean of logged Data	5.147
Maximum of Logged Data	6.317	SD of logged Data	0.818

Assuming Lognormal Distribution

95% H-UCL	606	90% Chebyshev (MVUE) UCL	430.3
95% Chebyshev (MVUE) UCL	521.7	97.5% Chebyshev (MVUE) UCL	648.7
99% Chebyshev (MVUE) UCL	898		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	347.2	95% Jackknife UCL	364.7
95% Standard Bootstrap UCL	340.6	95% Bootstrap-t UCL	636.2
95% Hall's Bootstrap UCL	1282	95% Percentile Bootstrap UCL	344.5
95% BCA Bootstrap UCL	379.5		
90% Chebyshev(Mean, Sd) UCL	442.1	95% Chebyshev(Mean, Sd) UCL	537.2
97.5% Chebyshev(Mean, Sd) UCL	669.3	99% Chebyshev(Mean, Sd) UCL	928.6

Suggested UCL to Use

95% Adjusted Gamma UCL	510.5

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.

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Zinc (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	33.9	Mean	269
Maximum	890	Median	135
SD	317.6	Std. Error of Mean	105.9
Coefficient of Variation	1.18	Skewness	1.566

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.703	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.366	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	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	465.8	95% Adjusted-CLT UCL (Chen-1995)	502.2
		95% Modified-t UCL (Johnson-1978)	475

Gamma GOF Test

A-D Test Statistic	0.661	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.261	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.287	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.037	k star (bias corrected MLE)	0.765
Theta hat (MLE)	259.4	Theta star (bias corrected MLE)	351.4
nu hat (MLE)	18.67	nu star (bias corrected)	13.78
MLE Mean (bias corrected)	269	MLE Sd (bias corrected)	307.5
		Approximate Chi Square Value (0.05)	6.42
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	5.397

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	577.3	95% Adjusted Gamma UCL (use when n<50)	686.7

Attachemnt C-1b

ProUCL Output for Surficial Soil - Metals (Total) by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.189	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.523	Mean of logged Data	5.04
Maximum of Logged Data	6.791	SD of logged Data	1.098

Assuming Lognormal Distribution

95% H-UCL	1083	90% Chebyshev (MVUE) UCL	550.9
95% Chebyshev (MVUE) UCL	683.9	97.5% Chebyshev (MVUE) UCL	868.4
99% Chebyshev (MVUE) UCL	1231		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	443.1	95% Jackknife UCL	465.8
95% Standard Bootstrap UCL	430.8	95% Bootstrap-t UCL	1239
95% Hall's Bootstrap UCL	1812	95% Percentile Bootstrap UCL	440.6
95% BCA Bootstrap UCL	484.1		
90% Chebyshev(Mean, Sd) UCL	586.6	95% Chebyshev(Mean, Sd) UCL	730.4
97.5% Chebyshev(Mean, Sd) UCL	930	99% Chebyshev(Mean, Sd) UCL	1322

Suggested UCL to Use

95% Adjusted Gamma UCL 686.7

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/31/2018 4:35:06 PM
From File	2018_05_21 Eco SO (2018) ProUCL input (STS-01 to -09) - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.36	Minimum Non-Detect	0.038
Maximum Detect	0.46	Maximum Non-Detect	0.23
Variance Detects	0.005	Percent Non-Detects	75%
Mean Detects	0.41	SD Detects	0.0707
Median Detects	0.41	CV Detects	0.172
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.899	SD of Logged Detects	0.173

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.131	KM Standard Error of Mean	0.0815
KM SD	0.163	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.285	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.265	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.376	95% KM Chebyshev UCL	0.486
97.5% KM Chebyshev UCL	0.64	99% KM Chebyshev UCL	0.942

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	66.91	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00613	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	267.6	nu star (bias corrected)	N/A
Mean (detects)	0.41		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.131	SD (KM)	0.163
Variance (KM)	0.0266	SE of Mean (KM)	0.0815
k hat (KM)	0.646	k star (KM)	0.487
nu hat (KM)	10.33	nu star (KM)	7.792
theta hat (KM)	0.203	theta star (KM)	0.269
80% gamma percentile (KM)	0.215	90% gamma percentile (KM)	0.356
95% gamma percentile (KM)	0.508	99% gamma percentile (KM)	0.882

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (7.79, α)	2.615	Adjusted Chi Square Value (7.79, β)	1.92
95% Gamma Approximate KM-UCL (use when n>=50)	0.39	95% Gamma Adjusted KM-UCL (use when n<50)	0.532

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	0.229	Mean in Log Scale	-1.56
SD in Original Scale	0.115	SD in Log Scale	0.413
95% t UCL (assumes normality of ROS data)	0.306	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.323		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.677	KM Geo Mean	0.0687
KM SD (logged)	1.029	95% Critical H Value (KM-Log)	3.497
KM Standard Error of Mean (logged)	0.514	95% H-UCL (KM -Log)	0.454
KM SD (logged)	1.029	95% Critical H Value (KM-Log)	3.497
KM Standard Error of Mean (logged)	0.514		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.155	Mean in Log Scale	-2.41
SD in Original Scale	0.164	SD in Log Scale	1.171
95% t UCL (Assumes normality)	0.265	95% H-Stat UCL	0.984

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Data do not follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL	0.285	KM H-UCL	0.454
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.

4,4'-DDD (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.1	Minimum Non-Detect	0.05
Maximum Detect	15	Maximum Non-Detect	0.25
Variance Detects	111	Percent Non-Detects	71.43%
Mean Detects	7.55	SD Detects	10.54
Median Detects	7.55	CV Detects	1.395
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.203	SD of Logged Detects	3.543

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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

KM Mean	2.196	KM Standard Error of Mean	2.794
KM SD	5.227	95% KM (BCA) UCL	N/A
95% KM (t) UCL	7.626	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	6.792	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	10.58	95% KM Chebyshev UCL	14.38
97.5% KM Chebyshev UCL	19.64	99% KM Chebyshev UCL	30

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.367	k star (bias corrected MLE)	N/A
Theta hat (MLE)	20.58	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.468	nu star (bias corrected)	N/A
Mean (detects)	7.55		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.196	SD (KM)	5.227
Variance (KM)	27.32	SE of Mean (KM)	2.794
k hat (KM)	0.177	k star (KM)	0.196
nu hat (KM)	2.472	nu star (KM)	2.746
theta hat (KM)	12.44	theta star (KM)	11.2
80% gamma percentile (KM)	2.864	90% gamma percentile (KM)	6.642
95% gamma percentile (KM)	11.37	99% gamma percentile (KM)	24.45

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (2.75, α)	0.301	Adjusted Chi Square Value (2.75, β)	0.156
95% Gamma Approximate KM-UCL (use when n>=50)	20.02	95% Gamma Adjusted KM-UCL (use when n<50)	38.75

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	2.157	Mean in Log Scale	-6.225
SD in Original Scale	5.663	SD in Log Scale	4.692
95% t UCL (assumes normality of ROS data)	6.317	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	8.153E+14		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.032	KM Geo Mean	0.131
KM SD (logged)	1.955	95% Critical H Value (KM-Log)	6.605
KM Standard Error of Mean (logged)	1.05	95% H-UCL (KM -Log)	172.6
KM SD (logged)	1.955	95% Critical H Value (KM-Log)	6.605
KM Standard Error of Mean (logged)	1.05		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.209	Mean in Log Scale	-1.937
SD in Original Scale	5.64	SD in Log Scale	2.131
95% t UCL (Assumes normality)	6.352	95% H-Stat UCL	710.5

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

99% KM (Chebyshev) UCL 30

Warning: Recommended UCL exceeds the maximum observation

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'-DDD (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.088	Minimum Non-Detect	0.024
Maximum Detect	0.36	Maximum Non-Detect	0.23
Variance Detects	0.0157	Percent Non-Detects	50%
Mean Detects	0.197	SD Detects	0.125
Median Detects	0.17	CV Detects	0.636
Skewness Detects	0.818	Kurtosis Detects	-1.258
Mean of Logged Detects	-1.782	SD of Logged Detects	0.652

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.256	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.126	KM Standard Error of Mean	0.0456
KM SD	0.108	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.212	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.201	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.263	95% KM Chebyshev UCL	0.325
97.5% KM Chebyshev UCL	0.411	99% KM Chebyshev UCL	0.58

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.317	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.282	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.396	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)	3.328	k star (bias corrected MLE)	0.999
Theta hat (MLE)	0.0592	Theta star (bias corrected MLE)	0.197
nu hat (MLE)	26.62	nu star (bias corrected)	7.989
Mean (detects)	0.197		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.112
Maximum	0.36	Median	0.065
SD	0.123	CV	1.104
k hat (MLE)	0.929	k star (bias corrected MLE)	0.664
Theta hat (MLE)	0.12	Theta star (bias corrected MLE)	0.168
nu hat (MLE)	14.86	nu star (bias corrected)	10.62
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (10.62, α)	4.333	Adjusted Chi Square Value (10.62, β)	3.376
95% Gamma Approximate UCL (use when n>=50)	0.274	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.126	SD (KM)	0.108
Variance (KM)	0.0116	SE of Mean (KM)	0.0456
k hat (KM)	1.369	k star (KM)	0.939
nu hat (KM)	21.9	nu star (KM)	15.02
theta hat (KM)	0.092	theta star (KM)	0.134
80% gamma percentile (KM)	0.204	90% gamma percentile (KM)	0.294
95% gamma percentile (KM)	0.386	99% gamma percentile (KM)	0.599

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.02, α)	7.275	Adjusted Chi Square Value (15.02, β)	5.966
95% Gamma Approximate KM-UCL (use when n>=50)	0.26	95% Gamma Adjusted KM-UCL (use when n<50)	0.317

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.127	Mean in Log Scale	-2.343
SD in Original Scale	0.112	SD in Log Scale	0.768
95% t UCL (assumes normality of ROS data)	0.202	95% Percentile Bootstrap UCL	0.19
95% BCA Bootstrap UCL	0.214	95% Bootstrap t UCL	0.388
95% H-UCL (Log ROS)	0.297		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.458	KM Geo Mean	0.0856
KM SD (logged)	0.92	95% Critical H Value (KM-Log)	3.232
KM Standard Error of Mean (logged)	0.447	95% H-UCL (KM -Log)	0.402
KM SD (logged)	0.92	95% Critical H Value (KM-Log)	3.232
KM Standard Error of Mean (logged)	0.447		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.134	Mean in Log Scale	-2.378
SD in Original Scale	0.111	SD in Log Scale	1.033
95% t UCL (Assumes normality)	0.208	95% H-Stat UCL	0.623

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.212

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'-DDD (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.072	Minimum Non-Detect	0.043
Maximum Detect	0.25	Maximum Non-Detect	0.42
Variance Detects	0.00578	Percent Non-Detects	50%
Mean Detects	0.153	SD Detects	0.076
Median Detects	0.145	CV Detects	0.497
Skewness Detects	0.531	Kurtosis Detects	-0.258
Mean of Logged Detects	-1.977	SD of Logged Detects	0.529

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.985	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.168	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.11	KM Standard Error of Mean	0.0313
KM SD	0.0709	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.169	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.161	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.204	95% KM Chebyshev UCL	0.246
97.5% KM Chebyshev UCL	0.305	99% KM Chebyshev UCL	0.421

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.192	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.164	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.396	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)	5.157	k star (bias corrected MLE)	1.456
Theta hat (MLE)	0.0297	Theta star (bias corrected MLE)	0.105
nu hat (MLE)	41.25	nu star (bias corrected)	11.65
Mean (detects)	0.153		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0939
Maximum	0.25	Median	0.0762
SD	0.0829	CV	0.883
k hat (MLE)	1.274	k star (bias corrected MLE)	0.88
Theta hat (MLE)	0.0737	Theta star (bias corrected MLE)	0.107
nu hat (MLE)	20.39	nu star (bias corrected)	14.08
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (14.08, α)	6.624	Adjusted Chi Square Value (14.08, β)	5.386
95% Gamma Approximate UCL (use when n>=50)	0.2	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.11	SD (KM)	0.0709
Variance (KM)	0.00502	SE of Mean (KM)	0.0313
k hat (KM)	2.409	k star (KM)	1.589
nu hat (KM)	38.54	nu star (KM)	25.42
theta hat (KM)	0.0457	theta star (KM)	0.0692
80% gamma percentile (KM)	0.169	90% gamma percentile (KM)	0.226
95% gamma percentile (KM)	0.281	99% gamma percentile (KM)	0.405

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.42, α)	14.93	Adjusted Chi Square Value (25.42, β)	12.94
95% Gamma Approximate KM-UCL (use when n>=50)	0.187	95% Gamma Adjusted KM-UCL (use when n<50)	0.216

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.995	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.151	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.104	Mean in Log Scale	-2.476
SD in Original Scale	0.0739	SD in Log Scale	0.684
95% t UCL (assumes normality of ROS data)	0.153	95% Percentile Bootstrap UCL	0.145
95% BCA Bootstrap UCL	0.154	95% Bootstrap t UCL	0.2
95% H-UCL (Log ROS)	0.213		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.405	KM Geo Mean	0.0903
KM SD (logged)	0.624	95% Critical H Value (KM-Log)	2.579
KM Standard Error of Mean (logged)	0.285	95% H-UCL (KM -Log)	0.201
KM SD (logged)	0.624	95% Critical H Value (KM-Log)	2.579
KM Standard Error of Mean (logged)	0.285		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.117	Mean in Log Scale	-2.441
SD in Original Scale	0.0851	SD in Log Scale	0.872
95% t UCL (Assumes normality)	0.174	95% H-Stat UCL	0.356

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	0.169

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDD (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	2	Number of Non-Detects	9
Number of Distinct Detects	2	Number of Distinct Non-Detects	9
Minimum Detect	0.22	Minimum Non-Detect	0.02
Maximum Detect	0.23	Maximum Non-Detect	0.5
Variance Detects	5.0000E-5	Percent Non-Detects	81.82%
Mean Detects	0.225	SD Detects	0.00707
Median Detects	0.225	CV Detects	0.0314
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.492	SD of Logged Detects	0.0314

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

KM Mean	0.0656	KM Standard Error of Mean	0.0402
KM SD	0.0853	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.138	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.132	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.186	95% KM Chebyshev UCL	0.241
97.5% KM Chebyshev UCL	0.317	99% KM Chebyshev UCL	0.465

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2025	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.1113E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8099	nu star (bias corrected)	N/A
Mean (detects)	0.225		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0656	SD (KM)	0.0853
Variance (KM)	0.00727	SE of Mean (KM)	0.0402
k hat (KM)	0.591	k star (KM)	0.491
nu hat (KM)	13.01	nu star (KM)	10.79
theta hat (KM)	0.111	theta star (KM)	0.134
80% gamma percentile (KM)	0.108	90% gamma percentile (KM)	0.178

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% gamma percentile (KM)	0.254	99% gamma percentile (KM)	0.439

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0278
Approximate Chi Square Value (10.79, α)	4.443	Adjusted Chi Square Value (10.79, β)	3.801
95% Gamma Approximate KM-UCL (use when n>=50)	0.159	95% Gamma Adjusted KM-UCL (use when n<50)	0.186

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	0.197	Mean in Log Scale	-1.625
SD in Original Scale	0.014	SD in Log Scale	0.0675
95% t UCL (assumes normality of ROS data)	0.205	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		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.374	KM Geo Mean	0.0342
KM SD (logged)	1.006	95% Critical H Value (KM-Log)	3.01
KM Standard Error of Mean (logged)	0.474	95% H-UCL (KM -Log)	0.148
KM SD (logged)	1.006	95% Critical H Value (KM-Log)	3.01
KM Standard Error of Mean (logged)	0.474		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.107	Mean in Log Scale	-2.799
SD in Original Scale	0.101	SD in Log Scale	1.203
95% t UCL (Assumes normality)	0.162	95% H-Stat UCL	0.458

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	0.138	KM H-UCL	0.148
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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDD (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.12	Minimum Non-Detect	0.2
Maximum Detect	2.5	Maximum Non-Detect	0.41
Variance Detects	1.711	Percent Non-Detects	62.5%
Mean Detects	0.997	SD Detects	1.308
Median Detects	0.37	CV Detects	1.312
Skewness Detects	1.661	Kurtosis Detects	N/A
Mean of Logged Detects	-0.733	SD of Logged Detects	1.535

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.454	KM Standard Error of Mean	0.337
KM SD	0.778	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.093	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.009	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.466	95% KM Chebyshev UCL	1.924
97.5% KM Chebyshev UCL	2.561	99% KM Chebyshev UCL	3.81

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.812	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.227	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.872	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.997

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.38
Maximum	2.5	Median	0.01
SD	0.866	CV	2.278
k hat (MLE)	0.313	k star (bias corrected MLE)	0.279
Theta hat (MLE)	1.213	Theta star (bias corrected MLE)	1.361
nu hat (MLE)	5.013	nu star (bias corrected)	4.466
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.47, α)	0.914	Adjusted Chi Square Value (4.47, β)	0.579
95% Gamma Approximate UCL (use when n>=50)	1.857	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.454	SD (KM)	0.778
Variance (KM)	0.606	SE of Mean (KM)	0.337
k hat (KM)	0.34	k star (KM)	0.296
nu hat (KM)	5.444	nu star (KM)	4.736
theta hat (KM)	1.334	theta star (KM)	1.534
80% gamma percentile (KM)	0.694	90% gamma percentile (KM)	1.341
95% gamma percentile (KM)	2.086	99% gamma percentile (KM)	4.024

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.74, α)	1.032	Adjusted Chi Square Value (4.74, β)	0.665
95% Gamma Approximate KM-UCL (use when n>=50)	2.083	95% Gamma Adjusted KM-UCL (use when n<50)	3.231

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.442	Mean in Log Scale	-1.69
SD in Original Scale	0.837	SD in Log Scale	1.178
95% t UCL (assumes normality of ROS data)	1.003	95% Percentile Bootstrap UCL	1.013
95% BCA Bootstrap UCL	1.306	95% Bootstrap t UCL	8.694
95% H-UCL (Log ROS)	2.073		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.576	KM Geo Mean	0.207
KM SD (logged)	1.021	95% Critical H Value (KM-Log)	3.477
KM Standard Error of Mean (logged)	0.447	95% H-UCL (KM -Log)	1.331
KM SD (logged)	1.021	95% Critical H Value (KM-Log)	3.477
KM Standard Error of Mean (logged)	0.447		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.453	Mean in Log Scale	-1.594
SD in Original Scale	0.832	SD in Log Scale	1.111
95% t UCL (Assumes normality)	1.01	95% H-Stat UCL	1.781

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	1.093

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'-DDD (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 4,4'-DDD (sts-07) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDD (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 4,4'-DDD (sts-08) was not processed!

4,4'-DDD (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.69	Minimum Non-Detect	0.0041
Maximum Detect	27	Maximum Non-Detect	4.4
Variance Detects	229.9	Percent Non-Detects	62.5%
Mean Detects	9.493	SD Detects	15.16
Median Detects	0.79	CV Detects	1.597
Skewness Detects	1.732	Kurtosis Detects	N/A
Mean of Logged Detects	0.896	SD of Logged Detects	2.079

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.753	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.384	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.593	KM Standard Error of Mean	3.834
KM SD	8.853	95% KM (BCA) UCL	N/A
95% KM (t) UCL	10.86	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	9.899	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	15.09	95% KM Chebyshev UCL	20.3
97.5% KM Chebyshev UCL	27.54	99% KM Chebyshev UCL	41.74

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.473	k star (bias corrected MLE)	N/A
Theta hat (MLE)	20.07	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.839	nu star (bias corrected)	N/A
Mean (detects)	9.493		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.566
Maximum	27	Median	0.01
SD	9.474	CV	2.657
k hat (MLE)	0.194	k star (bias corrected MLE)	0.205
Theta hat (MLE)	18.39	Theta star (bias corrected MLE)	17.44
nu hat (MLE)	3.102	nu star (bias corrected)	3.272
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.27, α)	0.457	Adjusted Chi Square Value (3.27, β)	0.266
95% Gamma Approximate UCL (use when n>=50)	25.51	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.593	SD (KM)	8.853
Variance (KM)	78.37	SE of Mean (KM)	3.834
k hat (KM)	0.165	k star (KM)	0.186
nu hat (KM)	2.636	nu star (KM)	2.981
theta hat (KM)	21.81	theta star (KM)	19.29
80% gamma percentile (KM)	4.552	90% gamma percentile (KM)	10.85
95% gamma percentile (KM)	18.85	99% gamma percentile (KM)	41.13

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.98, α)	0.367	Adjusted Chi Square Value (2.98, β)	0.211
95% Gamma Approximate KM-UCL (use when n>=50)	29.21	95% Gamma Adjusted KM-UCL (use when n<50)	50.83

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.778	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	3.571	Mean in Log Scale	-2.302
SD in Original Scale	9.472	SD in Log Scale	2.913
95% t UCL (assumes normality of ROS data)	9.916	95% Percentile Bootstrap UCL	10.23
95% BCA Bootstrap UCL	13.6	95% Bootstrap t UCL	140.7
95% H-UCL (Log ROS)	107054		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.883	KM Geo Mean	0.056
KM SD (logged)	3.271	95% Critical H Value (KM-Log)	9.793
KM Standard Error of Mean (logged)	1.473	95% H-UCL (KM -Log)	2135134
KM SD (logged)	3.271	95% Critical H Value (KM-Log)	9.793
KM Standard Error of Mean (logged)	1.473		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.863	Mean in Log Scale	-2.001
SD in Original Scale	9.378	SD in Log Scale	3.577
95% t UCL (Assumes normality)	10.14	95% H-Stat UCL	1.526E+8

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 10.86

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDE (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.38	Minimum Non-Detect	0.038
Maximum Detect	1	Maximum Non-Detect	0.21
Variance Detects	0.0546	Percent Non-Detects	37.5%
Mean Detects	0.62	SD Detects	0.234
Median Detects	0.58	CV Detects	0.377
Skewness Detects	1.282	Kurtosis Detects	2.222
Mean of Logged Detects	-0.53	SD of Logged Detects	0.356

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	0.402	KM Standard Error of Mean	0.129
KM SD	0.327	95% KM (BCA) UCL	0.592
95% KM (t) UCL	0.646	95% KM (Percentile Bootstrap) UCL	0.601
95% KM (z) UCL	0.614	95% KM Bootstrap t UCL	0.555
90% KM Chebyshev UCL	0.789	95% KM Chebyshev UCL	0.965
97.5% KM Chebyshev UCL	1.208	99% KM Chebyshev UCL	1.686

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.256	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.218	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.358	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)	9.721	k star (bias corrected MLE)	4.022
Theta hat (MLE)	0.0638	Theta star (bias corrected MLE)	0.154
nu hat (MLE)	97.21	nu star (bias corrected)	40.22

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.62

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0739	Mean	0.415
Maximum	1	Median	0.44
SD	0.333	CV	0.803
k hat (MLE)	1.305	k star (bias corrected MLE)	0.899
Theta hat (MLE)	0.318	Theta star (bias corrected MLE)	0.462
nu hat (MLE)	20.89	nu star (bias corrected)	14.39
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (14.39, α)	6.837	Adjusted Chi Square Value (14.39, β)	5.575
95% Gamma Approximate UCL (use when n>=50)	0.874	95% Gamma Adjusted UCL (use when n<50)	1.071

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.402	SD (KM)	0.327
Variance (KM)	0.107	SE of Mean (KM)	0.129
k hat (KM)	1.513	k star (KM)	1.029
nu hat (KM)	24.21	nu star (KM)	16.46
theta hat (KM)	0.266	theta star (KM)	0.39
80% gamma percentile (KM)	0.645	90% gamma percentile (KM)	0.919
95% gamma percentile (KM)	1.192	99% gamma percentile (KM)	1.824

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (16.46, α)	8.289	Adjusted Chi Square Value (16.46, β)	6.874
95% Gamma Approximate KM-UCL (use when n>=50)	0.798	95% Gamma Adjusted KM-UCL (use when n<50)	0.962

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	0.471	Mean in Log Scale	-0.896
SD in Original Scale	0.271	SD in Log Scale	0.572
95% t UCL (assumes normality of ROS data)	0.652	95% Percentile Bootstrap UCL	0.623
95% BCA Bootstrap UCL	0.653	95% Bootstrap t UCL	0.707
95% H-UCL (Log ROS)	0.822		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.558	KM Geo Mean	0.211
KM SD (logged)	1.35	95% Critical H Value (KM-Log)	4.334
KM Standard Error of Mean (logged)	0.534	95% H-UCL (KM -Log)	4.782
KM SD (logged)	1.35	95% Critical H Value (KM-Log)	4.334
KM Standard Error of Mean (logged)	0.534		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.406	Mean in Log Scale	-1.589
SD in Original Scale	0.345	SD in Log Scale	1.57
95% t UCL (Assumes normality)	0.637	95% H-Stat UCL	13.08

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	0.646

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'-DDE (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	0.12	Mean	1.417
Maximum	5.9	Median	0.75
SD	2.028	Std. Error of Mean	0.766
Coefficient of Variation	1.431	Skewness	2.378

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.657	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.38	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	2.906	95% Adjusted-CLT UCL (Chen-1995)	3.414
		95% Modified-t UCL (Johnson-1978)	3.021

Gamma GOF Test

A-D Test Statistic	0.406	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.321	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.845	k star (bias corrected MLE)	0.578
Theta hat (MLE)	1.677	Theta star (bias corrected MLE)	2.452
nu hat (MLE)	11.83	nu star (bias corrected)	8.092
MLE Mean (bias corrected)	1.417	MLE Sd (bias corrected)	1.864
		Approximate Chi Square Value (0.05)	2.789
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	1.939

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	4.113	95% Adjusted Gamma UCL (use when n<50)	5.913

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.171	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.12	Mean of logged Data	-0.349
Maximum of Logged Data	1.775	SD of logged Data	1.26

Assuming Lognormal Distribution

95% H-UCL	15.46	90% Chebyshev (MVUE) UCL	3.21
95% Chebyshev (MVUE) UCL	4.063	97.5% Chebyshev (MVUE) UCL	5.246
99% Chebyshev (MVUE) UCL	7.572		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	2.678	95% Jackknife UCL	2.906
95% Standard Bootstrap UCL	2.588	95% Bootstrap-t UCL	6.203
95% Hall's Bootstrap UCL	7.634	95% Percentile Bootstrap UCL	2.81
95% BCA Bootstrap UCL	3.474		
90% Chebyshev(Mean, Sd) UCL	3.716	95% Chebyshev(Mean, Sd) UCL	4.758
97.5% Chebyshev(Mean, Sd) UCL	6.203	99% Chebyshev(Mean, Sd) UCL	9.043

Suggested UCL to Use

95% Adjusted Gamma UCL 5.913

Recommended UCL exceeds the maximum observation

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'-DDE (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.074	Mean	0.592
Maximum	1.6	Median	0.545
SD	0.502	Std. Error of Mean	0.178
Coefficient of Variation	0.849	Skewness	1.13

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.928	95% Adjusted-CLT UCL (Chen-1995)	0.96
		95% Modified-t UCL (Johnson-1978)	0.94

Gamma GOF Test

A-D Test Statistic	0.235	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.73	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.167	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.299	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.401	k star (bias corrected MLE)	0.959
Theta hat (MLE)	0.422	Theta star (bias corrected MLE)	0.617
nu hat (MLE)	22.42	nu star (bias corrected)	15.34
MLE Mean (bias corrected)	0.592	MLE Sd (bias corrected)	0.604
		Approximate Chi Square Value (0.05)	7.501
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	6.168

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.21	95% Adjusted Gamma UCL (use when n<50)	1.472

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.191	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.604	Mean of logged Data	-0.922
Maximum of Logged Data	0.47	SD of logged Data	1.046

Assuming Lognormal Distribution

95% H-UCL	2.782	90% Chebyshev (MVUE) UCL	1.337
95% Chebyshev (MVUE) UCL	1.659	97.5% Chebyshev (MVUE) UCL	2.105
99% Chebyshev (MVUE) UCL	2.982		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	0.884	95% Jackknife UCL	0.928
95% Standard Bootstrap UCL	0.864	95% Bootstrap-t UCL	1.068
95% Hall's Bootstrap UCL	1.053	95% Percentile Bootstrap UCL	0.869
95% BCA Bootstrap UCL	0.956		
90% Chebyshev(Mean, Sd) UCL	1.125	95% Chebyshev(Mean, Sd) UCL	1.366
97.5% Chebyshev(Mean, Sd) UCL	1.701	99% Chebyshev(Mean, Sd) UCL	2.359

Suggested UCL to Use

95% Student's-t UCL 0.928

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'-DDE (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.17	Minimum Non-Detect	0.42
Maximum Detect	2.2	Maximum Non-Detect	0.42
Variance Detects	0.476	Percent Non-Detects	12.5%
Mean Detects	0.669	SD Detects	0.69
Median Detects	0.44	CV Detects	1.032
Skewness Detects	2.41	Kurtosis Detects	6.088
Mean of Logged Detects	-0.709	SD of Logged Detects	0.779

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.656	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.379	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.623	KM Standard Error of Mean	0.234
KM SD	0.611	95% KM (BCA) UCL	1.086
95% KM (t) UCL	1.066	95% KM (Percentile Bootstrap) UCL	1.053
95% KM (z) UCL	1.007	95% KM Bootstrap t UCL	2.083
90% KM Chebyshev UCL	1.324	95% KM Chebyshev UCL	1.642
97.5% KM Chebyshev UCL	2.083	99% KM Chebyshev UCL	2.949

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.659	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.288	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.316	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)	1.783	k star (bias corrected MLE)	1.114
Theta hat (MLE)	0.375	Theta star (bias corrected MLE)	0.6
nu hat (MLE)	24.96	nu star (bias corrected)	15.6
Mean (detects)	0.669		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.147	Mean	0.603
Maximum	2.2	Median	0.425
SD	0.665	CV	1.102
k hat (MLE)	1.556	k star (bias corrected MLE)	1.056
Theta hat (MLE)	0.388	Theta star (bias corrected MLE)	0.572
nu hat (MLE)	24.89	nu star (bias corrected)	16.89
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (16.89, α)	8.595	Adjusted Chi Square Value (16.89, β)	7.15
95% Gamma Approximate UCL (use when n>=50)	1.186	95% Gamma Adjusted UCL (use when n<50)	1.425

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.623	SD (KM)	0.611
Variance (KM)	0.373	SE of Mean (KM)	0.234
k hat (KM)	1.04	k star (KM)	0.733
nu hat (KM)	16.64	nu star (KM)	11.74
theta hat (KM)	0.599	theta star (KM)	0.849
80% gamma percentile (KM)	1.022	90% gamma percentile (KM)	1.546
95% gamma percentile (KM)	2.085	99% gamma percentile (KM)	3.365

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.74, α)	5.053	Adjusted Chi Square Value (11.74, β)	4.002
95% Gamma Approximate KM-UCL (use when n>=50)	1.447	95% Gamma Adjusted KM-UCL (use when n<50)	1.827

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	0.618	Mean in Log Scale	-0.788
SD in Original Scale	0.655	SD in Log Scale	0.755
95% t UCL (assumes normality of ROS data)	1.056	95% Percentile Bootstrap UCL	1.034
95% BCA Bootstrap UCL	1.144	95% Bootstrap t UCL	2.125
95% H-UCL (Log ROS)	1.366		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.777	KM Geo Mean	0.46
KM SD (logged)	0.711	95% Critical H Value (KM-Log)	2.758
KM Standard Error of Mean (logged)	0.278	95% H-UCL (KM -Log)	1.242
KM SD (logged)	0.711	95% Critical H Value (KM-Log)	2.758
KM Standard Error of Mean (logged)	0.278		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.611	Mean in Log Scale	-0.815
SD in Original Scale	0.659	SD in Log Scale	0.781
95% t UCL (Assumes normality)	1.053	95% H-Stat UCL	1.419

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 Adjusted Gamma UCL	1.827	95% GROS Adjusted Gamma UCL	1.425

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDE (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.092	Minimum Non-Detect	0.044
Maximum Detect	2.8	Maximum Non-Detect	0.044
Variance Detects	0.689	Percent Non-Detects	9.091%
Mean Detects	0.834	SD Detects	0.83
Median Detects	0.75	CV Detects	0.995
Skewness Detects	1.534	Kurtosis Detects	3.008
Mean of Logged Detects	-0.744	SD of Logged Detects	1.238

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.825	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	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

KM Mean	0.762	KM Standard Error of Mean	0.249
KM SD	0.784	95% KM (BCA) UCL	1.177
95% KM (t) UCL	1.214	95% KM (Percentile Bootstrap) UCL	1.187
95% KM (z) UCL	1.172	95% KM Bootstrap t UCL	1.494
90% KM Chebyshev UCL	1.51	95% KM Chebyshev UCL	1.849
97.5% KM Chebyshev UCL	2.319	99% KM Chebyshev UCL	3.243

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.465	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.748	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.181	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.274	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)	1.023	k star (bias corrected MLE)	0.783
Theta hat (MLE)	0.815	Theta star (bias corrected MLE)	1.065
nu hat (MLE)	20.47	nu star (bias corrected)	15.66
Mean (detects)	0.834		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.759
Maximum	2.8	Median	0.67
SD	0.826	CV	1.088
k hat (MLE)	0.733	k star (bias corrected MLE)	0.594
Theta hat (MLE)	1.036	Theta star (bias corrected MLE)	1.279
nu hat (MLE)	16.12	nu star (bias corrected)	13.06
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (13.06, α)	5.933	Adjusted Chi Square Value (13.06, β)	5.17
95% Gamma Approximate UCL (use when n>=50)	1.671	95% Gamma Adjusted UCL (use when n<50)	1.917

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.762	SD (KM)	0.784
Variance (KM)	0.615	SE of Mean (KM)	0.249
k hat (KM)	0.944	k star (KM)	0.747
nu hat (KM)	20.77	nu star (KM)	16.44
theta hat (KM)	0.807	theta star (KM)	1.02
80% gamma percentile (KM)	1.25	90% gamma percentile (KM)	1.884
95% gamma percentile (KM)	2.534	99% gamma percentile (KM)	4.077

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (16.44, α)	8.275	Adjusted Chi Square Value (16.44, β)	7.349
95% Gamma Approximate KM-UCL (use when n>=50)	1.514	95% Gamma Adjusted KM-UCL (use when n<50)	1.705

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	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	0.76	Mean in Log Scale	-1.012
SD in Original Scale	0.824	SD in Log Scale	1.473
95% t UCL (assumes normality of ROS data)	1.211	95% Percentile Bootstrap UCL	1.164
95% BCA Bootstrap UCL	1.259	95% Bootstrap t UCL	1.441
95% H-UCL (Log ROS)	6.842		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.96	KM Geo Mean	0.383
KM SD (logged)	1.312	95% Critical H Value (KM-Log)	3.63
KM Standard Error of Mean (logged)	0.417	95% H-UCL (KM -Log)	4.082
KM SD (logged)	1.312	95% Critical H Value (KM-Log)	3.63
KM Standard Error of Mean (logged)	0.417		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.76	Mean in Log Scale	-1.023
SD in Original Scale	0.825	SD in Log Scale	1.496
95% t UCL (Assumes normality)	1.211	95% H-Stat UCL	7.38

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 1.214

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDE (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.33	Minimum Non-Detect	0.21
Maximum Detect	2.4	Maximum Non-Detect	0.41
Variance Detects	0.835	Percent Non-Detects	25%
Mean Detects	1.133	SD Detects	0.914
Median Detects	0.81	CV Detects	0.806
Skewness Detects	0.671	Kurtosis Detects	-1.851
Mean of Logged Detects	-0.183	SD of Logged Detects	0.881

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.84	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	0.913	KM Standard Error of Mean	0.317
KM SD	0.817	95% KM (BCA) UCL	1.418
95% KM (t) UCL	1.513	95% KM (Percentile Bootstrap) UCL	1.41
95% KM (z) UCL	1.434	95% KM Bootstrap t UCL	2.267
90% KM Chebyshev UCL	1.863	95% KM Chebyshev UCL	2.294
97.5% KM Chebyshev UCL	2.891	99% KM Chebyshev UCL	4.064

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.447	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.243	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.769	k star (bias corrected MLE)	0.996
Theta hat (MLE)	0.641	Theta star (bias corrected MLE)	1.138
nu hat (MLE)	21.23	nu star (bias corrected)	11.95
Mean (detects)	1.133		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.858
Maximum	2.4	Median	0.435
SD	0.926	CV	1.079
k hat (MLE)	0.659	k star (bias corrected MLE)	0.495
Theta hat (MLE)	1.303	Theta star (bias corrected MLE)	1.734
nu hat (MLE)	10.54	nu star (bias corrected)	7.919
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (7.92, α)	2.688	Adjusted Chi Square Value (7.92, β)	1.981
95% Gamma Approximate UCL (use when n>=50)	2.527	95% Gamma Adjusted UCL (use when n<50)	3.43

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.913	SD (KM)	0.817
Variance (KM)	0.668	SE of Mean (KM)	0.317
k hat (KM)	1.249	k star (KM)	0.864
nu hat (KM)	19.98	nu star (KM)	13.82
theta hat (KM)	0.731	theta star (KM)	1.057
80% gamma percentile (KM)	1.486	90% gamma percentile (KM)	2.18
95% gamma percentile (KM)	2.882	99% gamma percentile (KM)	4.532

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.82, α)	6.448	Adjusted Chi Square Value (13.82, β)	5.23
95% Gamma Approximate KM-UCL (use when n>=50)	1.957	95% Gamma Adjusted KM-UCL (use when n<50)	2.414

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.893	Mean in Log Scale	-0.598
SD in Original Scale	0.892	SD in Log Scale	1.095
95% t UCL (assumes normality of ROS data)	1.491	95% Percentile Bootstrap UCL	1.417
95% BCA Bootstrap UCL	1.509	95% Bootstrap t UCL	1.865
95% H-UCL (Log ROS)	4.556		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.488	KM Geo Mean	0.614
KM SD (logged)	0.881	95% Critical H Value (KM-Log)	3.139
KM Standard Error of Mean (logged)	0.343	95% H-UCL (KM -Log)	2.574
KM SD (logged)	0.881	95% Critical H Value (KM-Log)	3.139
KM Standard Error of Mean (logged)	0.343		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.889	Mean in Log Scale	-0.617
SD in Original Scale	0.896	SD in Log Scale	1.11
95% t UCL (Assumes normality)	1.489	95% H-Stat UCL	4.724

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	1.513

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'-DDE (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.093	Minimum Non-Detect	0.024
Maximum Detect	1.8	Maximum Non-Detect	7.6
Variance Detects	0.585	Percent Non-Detects	50%
Mean Detects	0.741	SD Detects	0.765
Median Detects	0.535	CV Detects	1.033
Skewness Detects	1.219	Kurtosis Detects	0.894
Mean of Logged Detects	-0.824	SD of Logged Detects	1.284

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.445	KM Standard Error of Mean	0.266
KM SD	0.608	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.949	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.883	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.243	95% KM Chebyshev UCL	1.605
97.5% KM Chebyshev UCL	2.107	99% KM Chebyshev UCL	3.092

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.21	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.666	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.203	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.402	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)	1.091	k star (bias corrected MLE)	0.439
Theta hat (MLE)	0.679	Theta star (bias corrected MLE)	1.686
nu hat (MLE)	8.727	nu star (bias corrected)	3.515
Mean (detects)	0.741		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.382
Maximum	1.8	Median	0.077
SD	0.631	CV	1.654
k hat (MLE)	0.427	k star (bias corrected MLE)	0.35
Theta hat (MLE)	0.894	Theta star (bias corrected MLE)	1.09
nu hat (MLE)	6.83	nu star (bias corrected)	5.602
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.60, α)	1.44	Adjusted Chi Square Value (5.60, β)	0.975
95% Gamma Approximate UCL (use when n>=50)	1.485	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.445	SD (KM)	0.608
Variance (KM)	0.37	SE of Mean (KM)	0.266
k hat (KM)	0.536	k star (KM)	0.418
nu hat (KM)	8.58	nu star (KM)	6.696
theta hat (KM)	0.83	theta star (KM)	1.064
80% gamma percentile (KM)	0.722	90% gamma percentile (KM)	1.247
95% gamma percentile (KM)	1.821	99% gamma percentile (KM)	3.257

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.70, α)	2.005	Adjusted Chi Square Value (6.70, β)	1.422
95% Gamma Approximate KM-UCL (use when n>=50)	1.487	95% Gamma Adjusted KM-UCL (use when n<50)	2.096

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.987	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.399	Mean in Log Scale	-1.999
SD in Original Scale	0.621	SD in Log Scale	1.629
95% t UCL (assumes normality of ROS data)	0.815	95% Percentile Bootstrap UCL	0.753
95% BCA Bootstrap UCL	0.899	95% Bootstrap t UCL	2.548
95% H-UCL (Log ROS)	11.74		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.933	KM Geo Mean	0.145
KM SD (logged)	1.608	95% Critical H Value (KM-Log)	5.037
KM Standard Error of Mean (logged)	0.727	95% H-UCL (KM -Log)	11.25
KM SD (logged)	1.608	95% Critical H Value (KM-Log)	5.037
KM Standard Error of Mean (logged)	0.727		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.881	Mean in Log Scale	-1.375
SD in Original Scale	1.322	SD in Log Scale	1.922
95% t UCL (Assumes normality)	1.766	95% H-Stat UCL	118

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 0.949

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'-DDE (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.12	Mean	0.658
Maximum	1.7	Median	0.585
SD	0.519	Std. Error of Mean	0.184
Coefficient of Variation	0.79	Skewness	1.137

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.155	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	1.005	95% Adjusted-CLT UCL (Chen-1995)	1.038
		95% Modified-t UCL (Johnson-1978)	1.018

Gamma GOF Test

A-D Test Statistic	0.22	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.157	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.685	k star (bias corrected MLE)	1.137
Theta hat (MLE)	0.39	Theta star (bias corrected MLE)	0.578
nu hat (MLE)	26.96	nu star (bias corrected)	18.19
MLE Mean (bias corrected)	0.658	MLE Sd (bias corrected)	0.617
		Approximate Chi Square Value (0.05)	9.526
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	7.991

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.255	95% Adjusted Gamma UCL (use when n<50)	1.496

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.188	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.12	Mean of logged Data	-0.744
Maximum of Logged Data	0.531	SD of logged Data	0.93

Assuming Lognormal Distribution

95% H-UCL	2.3	90% Chebyshev (MVUE) UCL	1.372
95% Chebyshev (MVUE) UCL	1.684	97.5% Chebyshev (MVUE) UCL	2.116
99% Chebyshev (MVUE) UCL	2.966		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	0.96	95% Jackknife UCL	1.005
95% Standard Bootstrap UCL	0.936	95% Bootstrap-t UCL	1.124
95% Hall's Bootstrap UCL	1.21	95% Percentile Bootstrap UCL	0.951
95% BCA Bootstrap UCL	0.981		
90% Chebyshev(Mean, Sd) UCL	1.208	95% Chebyshev(Mean, Sd) UCL	1.458
97.5% Chebyshev(Mean, Sd) UCL	1.804	99% Chebyshev(Mean, Sd) UCL	2.485

Suggested UCL to Use

95% Student's-t UCL 1.005

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'-DDE (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.036	Minimum Non-Detect	4.4
Maximum Detect	25	Maximum Non-Detect	4.4
Variance Detects	84.35	Percent Non-Detects	12.5%
Mean Detects	4.257	SD Detects	9.184
Median Detects	1	CV Detects	2.157
Skewness Detects	2.601	Kurtosis Detects	6.815
Mean of Logged Detects	-0.588	SD of Logged Detects	2.347

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.532	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.442	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.825	KM Standard Error of Mean	3.073
KM SD	8.041	95% KM (BCA) UCL	9.69
95% KM (t) UCL	9.647	95% KM (Percentile Bootstrap) UCL	9.734
95% KM (z) UCL	8.88	95% KM Bootstrap t UCL	51.15
90% KM Chebyshev UCL	13.04	95% KM Chebyshev UCL	17.22
97.5% KM Chebyshev UCL	23.02	99% KM Chebyshev UCL	34.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.535	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.779	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.252	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.334	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)	0.333	k star (bias corrected MLE)	0.285
Theta hat (MLE)	12.79	Theta star (bias corrected MLE)	14.92
nu hat (MLE)	4.66	nu star (bias corrected)	3.996
Mean (detects)	4.257		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.726
Maximum	25	Median	0.555
SD	8.635	CV	2.317
k hat (MLE)	0.288	k star (bias corrected MLE)	0.264
Theta hat (MLE)	12.92	Theta star (bias corrected MLE)	14.14
nu hat (MLE)	4.615	nu star (bias corrected)	4.218
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.22, α)	0.81	Adjusted Chi Square Value (4.22, β)	0.504
95% Gamma Approximate UCL (use when n>=50)	19.41	95% Gamma Adjusted UCL (use when n<50)	31.19

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.825	SD (KM)	8.041
Variance (KM)	64.66	SE of Mean (KM)	3.073
k hat (KM)	0.226	k star (KM)	0.225
nu hat (KM)	3.621	nu star (KM)	3.596
theta hat (KM)	16.9	theta star (KM)	17.02
80% gamma percentile (KM)	5.329	90% gamma percentile (KM)	11.55
95% gamma percentile (KM)	19.1	99% gamma percentile (KM)	39.5

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.60, α)	0.569	Adjusted Chi Square Value (3.60, β)	0.338
95% Gamma Approximate KM-UCL (use when n>=50)	24.18	95% Gamma Adjusted KM-UCL (use when n<50)	40.68

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.183	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	3.765	Mean in Log Scale	-0.657
SD in Original Scale	8.616	SD in Log Scale	2.181
95% t UCL (assumes normality of ROS data)	9.537	95% Percentile Bootstrap UCL	9.737
95% BCA Bootstrap UCL	12.69	95% Bootstrap t UCL	57.17
95% H-UCL (Log ROS)	1343		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.668	KM Geo Mean	0.513
KM SD (logged)	2.124	95% Critical H Value (KM-Log)	6.485
KM Standard Error of Mean (logged)	0.845	95% H-UCL (KM -Log)	891.1
KM SD (logged)	2.124	95% Critical H Value (KM-Log)	6.485
KM Standard Error of Mean (logged)	0.845		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4	Mean in Log Scale	-0.416
SD in Original Scale	8.534	SD in Log Scale	2.226
95% t UCL (Assumes normality)	9.717	95% H-Stat UCL	2357

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 Bootstrap t UCL	51.15	djusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	40.68

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.35	Minimum Non-Detect	0.038
Maximum Detect	5.8	Maximum Non-Detect	0.043
Variance Detects	3.716	Percent Non-Detects	25%
Mean Detects	2.792	SD Detects	1.928
Median Detects	2.5	CV Detects	0.691
Skewness Detects	0.531	Kurtosis Detects	-0.00683
Mean of Logged Detects	0.726	SD of Logged Detects	0.986

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	2.103	KM Standard Error of Mean	0.749
KM SD	1.935	95% KM (BCA) UCL	3.224
95% KM (t) UCL	3.523	95% KM (Percentile Bootstrap) UCL	3.288
95% KM (z) UCL	3.336	95% KM Bootstrap t UCL	3.721
90% KM Chebyshev UCL	4.352	95% KM Chebyshev UCL	5.37
97.5% KM Chebyshev UCL	6.784	99% KM Chebyshev UCL	9.56

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.235	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.188	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.336	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)	1.811	k star (bias corrected MLE)	1.017
Theta hat (MLE)	1.541	Theta star (bias corrected MLE)	2.745
nu hat (MLE)	21.74	nu star (bias corrected)	12.2

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	2.792

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.096
Maximum	5.8	Median	1.95
SD	2.077	CV	0.991
k hat (MLE)	0.475	k star (bias corrected MLE)	0.38
Theta hat (MLE)	4.41	Theta star (bias corrected MLE)	5.511
nu hat (MLE)	7.605	nu star (bias corrected)	6.086
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.09, α)	1.684	Adjusted Chi Square Value (6.09, β)	1.166
95% Gamma Approximate UCL (use when n>=50)	7.576	95% Gamma Adjusted UCL (use when n<50)	10.94

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.103	SD (KM)	1.935
Variance (KM)	3.745	SE of Mean (KM)	0.749
k hat (KM)	1.181	k star (KM)	0.822
nu hat (KM)	18.9	nu star (KM)	13.15
theta hat (KM)	1.78	theta star (KM)	2.56
80% gamma percentile (KM)	3.432	90% gamma percentile (KM)	5.081
95% gamma percentile (KM)	6.758	99% gamma percentile (KM)	10.71

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.15, α)	5.992	Adjusted Chi Square Value (13.15, β)	4.826
95% Gamma Approximate KM-UCL (use when n>=50)	4.615	95% Gamma Adjusted KM-UCL (use when n<50)	5.73

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	2.145	Mean in Log Scale	0.149
SD in Original Scale	2.022	SD in Log Scale	1.356
95% t UCL (assumes normality of ROS data)	3.499	95% Percentile Bootstrap UCL	3.288
95% BCA Bootstrap UCL	3.55	95% Bootstrap t UCL	3.997
95% H-UCL (Log ROS)	26.99		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.273	KM Geo Mean	0.761
KM SD (logged)	1.898	95% Critical H Value (KM-Log)	5.847
KM Standard Error of Mean (logged)	0.735	95% H-UCL (KM -Log)	305.6
KM SD (logged)	1.898	95% Critical H Value (KM-Log)	5.847
KM Standard Error of Mean (logged)	0.735		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.099	Mean in Log Scale	-0.431
SD in Original Scale	2.074	SD in Log Scale	2.299
95% t UCL (Assumes normality)	3.488	95% H-Stat UCL	3946

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	3.523

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 (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	0.055	Mean	41.22
Maximum	280	Median	1.9
SD	105.3	Std. Error of Mean	39.8
Coefficient of Variation	2.555	Skewness	2.645

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.462	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.5	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	118.6	95% Adjusted-CLT UCL (Chen-1995)	149.2
		95% Modified-t UCL (Johnson-1978)	125.2

Gamma GOF Test

A-D Test Statistic	1.155	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.81	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.448	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.34	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.234	k star (bias corrected MLE)	0.229
Theta hat (MLE)	176.5	Theta star (bias corrected MLE)	180.2
nu hat (MLE)	3.27	nu star (bias corrected)	3.202
MLE Mean (bias corrected)	41.22	MLE Sd (bias corrected)	86.19
		Approximate Chi Square Value (0.05)	0.435
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	0.226

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	303.6	95% Adjusted Gamma UCL (use when n<50)	585.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.88	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.309	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.9	Mean of logged Data	0.645
Maximum of Logged Data	5.635	SD of logged Data	2.589

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	496479	90% Chebyshev (MVUE) UCL	63.04
95% Chebyshev (MVUE) UCL	83.32	97.5% Chebyshev (MVUE) UCL	111.5
99% Chebyshev (MVUE) UCL	166.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	106.7	95% Jackknife UCL	118.6
95% Standard Bootstrap UCL	99.95	95% Bootstrap-t UCL	5823
95% Hall's Bootstrap UCL	3771	95% Percentile Bootstrap UCL	120.6
95% BCA Bootstrap UCL	121.2		
90% Chebyshev(Mean, Sd) UCL	160.6	95% Chebyshev(Mean, Sd) UCL	214.7
97.5% Chebyshev(Mean, Sd) UCL	289.8	99% Chebyshev(Mean, Sd) UCL	437.2

Suggested UCL to Use

99% Chebyshev (Mean, Sd) UCL 437.2

Recommended UCL exceeds the maximum observation

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 (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.054	Mean	3.617
Maximum	16	Median	1.3
SD	5.245	Std. Error of Mean	1.854
Coefficient of Variation	1.45	Skewness	2.361

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.669	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.316	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	7.13	95% Adjusted-CLT UCL (Chen-1995)	8.321
		95% Modified-t UCL (Johnson-1978)	7.388

Gamma GOF Test

A-D Test Statistic	0.362	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.751	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.203	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.306	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.669	k star (bias corrected MLE)	0.501
Theta hat (MLE)	5.407	Theta star (bias corrected MLE)	7.213
nu hat (MLE)	10.7	nu star (bias corrected)	8.023
MLE Mean (bias corrected)	3.617	MLE Sd (bias corrected)	5.108
		Approximate Chi Square Value (0.05)	2.748
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.031

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	10.56	95% Adjusted Gamma UCL (use when n<50)	14.29

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.246	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.919	Mean of logged Data	0.376
Maximum of Logged Data	2.773	SD of logged Data	1.668

Assuming Lognormal Distribution

95% H-UCL	155.4	90% Chebyshev (MVUE) UCL	11.93
95% Chebyshev (MVUE) UCL	15.37	97.5% Chebyshev (MVUE) UCL	20.16
99% Chebyshev (MVUE) UCL	29.55		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	6.667	95% Jackknife UCL	7.13
95% Standard Bootstrap UCL	6.536	95% Bootstrap-t UCL	13.46
95% Hall's Bootstrap UCL	16.69	95% Percentile Bootstrap UCL	7.028
95% BCA Bootstrap UCL	8.885		
90% Chebyshev(Mean, Sd) UCL	9.18	95% Chebyshev(Mean, Sd) UCL	11.7
97.5% Chebyshev(Mean, Sd) UCL	15.2	99% Chebyshev(Mean, Sd) UCL	22.07

Suggested UCL to Use

95% Adjusted Gamma UCL 14.29

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 (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.41	Mean	3.379
Maximum	12	Median	1.8
SD	3.904	Std. Error of Mean	1.38
Coefficient of Variation	1.155	Skewness	1.884

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.77	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.248	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5.994	95% Adjusted-CLT UCL (Chen-1995)	6.631
		95% Modified-t UCL (Johnson-1978)	6.147

Gamma GOF Test

A-D Test Statistic	0.297	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.195	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.074	k star (bias corrected MLE)	0.754
Theta hat (MLE)	3.147	Theta star (bias corrected MLE)	4.479
nu hat (MLE)	17.18	nu star (bias corrected)	12.07
MLE Mean (bias corrected)	3.379	MLE Sd (bias corrected)	3.89
		Approximate Chi Square Value (0.05)	5.273
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.194

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	7.734	95% Adjusted Gamma UCL (use when n<50)	9.724

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.892	Mean of logged Data	0.684
Maximum of Logged Data	2.485	SD of logged Data	1.109

Assuming Lognormal Distribution

95% H-UCL	17.29	90% Chebyshev (MVUE) UCL	7.261
95% Chebyshev (MVUE) UCL	9.055	97.5% Chebyshev (MVUE) UCL	11.55
99% Chebyshev (MVUE) UCL	16.44		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	5.649	95% Jackknife UCL	5.994
95% Standard Bootstrap UCL	5.562	95% Bootstrap-t UCL	10.43
95% Hall's Bootstrap UCL	15.73	95% Percentile Bootstrap UCL	5.639
95% BCA Bootstrap UCL	6.546		
90% Chebyshev(Mean, Sd) UCL	7.52	95% Chebyshev(Mean, Sd) UCL	9.395
97.5% Chebyshev(Mean, Sd) UCL	12	99% Chebyshev(Mean, Sd) UCL	17.11

Suggested UCL to Use

95% Student's-t UCL 5.994

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	0.069	Mean	1.898
Maximum	8.6	Median	1.1
SD	2.463	Std. Error of Mean	0.743
Coefficient of Variation	1.298	Skewness	2.281

Normal GOF Test

Shapiro Wilk Test Statistic	0.716	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	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	3.244	95% Adjusted-CLT UCL (Chen-1995)	3.665
		95% Modified-t UCL (Johnson-1978)	3.329

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.381	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.766	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.193	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.705	k star (bias corrected MLE)	0.574
Theta hat (MLE)	2.691	Theta star (bias corrected MLE)	3.309
nu hat (MLE)	15.52	nu star (bias corrected)	12.62
MLE Mean (bias corrected)	1.898	MLE Sd (bias corrected)	2.506
		Approximate Chi Square Value (0.05)	5.638
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	4.898

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	4.249	95% Adjusted Gamma UCL (use when n<50)	4.89

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.674	Mean of logged Data	-0.215
Maximum of Logged Data	2.152	SD of logged Data	1.542

Assuming Lognormal Distribution

95% H-UCL	19.79	90% Chebyshev (MVUE) UCL	5.481
95% Chebyshev (MVUE) UCL	6.972	97.5% Chebyshev (MVUE) UCL	9.04
99% Chebyshev (MVUE) UCL	13.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.12	95% Jackknife UCL	3.244
95% Standard Bootstrap UCL	3.014	95% Bootstrap-t UCL	4.491
95% Hall's Bootstrap UCL	7.893	95% Percentile Bootstrap UCL	3.16
95% BCA Bootstrap UCL	3.676		
90% Chebyshev(Mean, Sd) UCL	4.126	95% Chebyshev(Mean, Sd) UCL	5.135
97.5% Chebyshev(Mean, Sd) UCL	6.536	99% Chebyshev(Mean, Sd) UCL	9.287

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% Adjusted Gamma UCL 4.89

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 (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.68	Minimum Non-Detect	0.21
Maximum Detect	7.9	Maximum Non-Detect	0.21
Variance Detects	8.272	Percent Non-Detects	12.5%
Mean Detects	3.473	SD Detects	2.876
Median Detects	2.8	CV Detects	0.828
Skewness Detects	0.547	Kurtosis Detects	-1.425
Mean of Logged Detects	0.862	SD of Logged Detects	1.006

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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

KM Mean	3.065	KM Standard Error of Mean	1.037
KM SD	2.714	95% KM (BCA) UCL	4.7
95% KM (t) UCL	5.029	95% KM (Percentile Bootstrap) UCL	4.68
95% KM (z) UCL	4.77	95% KM Bootstrap t UCL	5.507
90% KM Chebyshev UCL	6.175	95% KM Chebyshev UCL	7.583
97.5% KM Chebyshev UCL	9.539	99% KM Chebyshev UCL	13.38

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.436	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.262	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.317	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)	1.449	k star (bias corrected MLE)	0.923
Theta hat (MLE)	2.397	Theta star (bias corrected MLE)	3.762
nu hat (MLE)	20.29	nu star (bias corrected)	12.93
Mean (detects)	3.473		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.04
Maximum	7.9	Median	1.885
SD	2.931	CV	0.964
k hat (MLE)	0.654	k star (bias corrected MLE)	0.492
Theta hat (MLE)	4.65	Theta star (bias corrected MLE)	6.18
nu hat (MLE)	10.46	nu star (bias corrected)	7.871
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (7.87, α)	2.66	Adjusted Chi Square Value (7.87, β)	1.958
95% Gamma Approximate UCL (use when n>=50)	8.994	95% Gamma Adjusted UCL (use when n<50)	12.22

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.065	SD (KM)	2.714
Variance (KM)	7.368	SE of Mean (KM)	1.037
k hat (KM)	1.275	k star (KM)	0.88
nu hat (KM)	20.4	nu star (KM)	14.08
theta hat (KM)	2.404	theta star (KM)	3.482
80% gamma percentile (KM)	4.98	90% gamma percentile (KM)	7.282
95% gamma percentile (KM)	9.608	99% gamma percentile (KM)	15.06

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.08, α)	6.628	Adjusted Chi Square Value (14.08, β)	5.389
95% Gamma Approximate KM-UCL (use when n>=50)	6.512	95% Gamma Adjusted KM-UCL (use when n<50)	8.009

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	3.064	Mean in Log Scale	0.555
SD in Original Scale	2.903	SD in Log Scale	1.274
95% t UCL (assumes normality of ROS data)	5.009	95% Percentile Bootstrap UCL	4.743
95% BCA Bootstrap UCL	4.929	95% Bootstrap t UCL	5.476
95% H-UCL (Log ROS)	28.66		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.559	KM Geo Mean	1.749
KM SD (logged)	1.184	95% Critical H Value (KM-Log)	3.893
KM Standard Error of Mean (logged)	0.452	95% H-UCL (KM -Log)	20.11
KM SD (logged)	1.184	95% Critical H Value (KM-Log)	3.893
KM Standard Error of Mean (logged)	0.452		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.052	Mean in Log Scale	0.472
SD in Original Scale	2.917	SD in Log Scale	1.443
95% t UCL (Assumes normality)	5.006	95% H-Stat UCL	55.27

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	5.029

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.18	Mean	17.84
Maximum	130	Median	1.25
SD	45.36	Std. Error of Mean	16.04
Coefficient of Variation	2.542	Skewness	2.819

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.453	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.487	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	48.23	95% Adjusted-CLT UCL (Chen-1995)	61.3
		95% Modified-t UCL (Johnson-1978)	50.89

Gamma GOF Test

A-D Test Statistic	1.047	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.8	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.353	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.317	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.293	k star (bias corrected MLE)	0.267
Theta hat (MLE)	60.81	Theta star (bias corrected MLE)	66.9
nu hat (MLE)	4.695	nu star (bias corrected)	4.268
MLE Mean (bias corrected)	17.84	MLE Sd (bias corrected)	34.55
		Approximate Chi Square Value (0.05)	0.83
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.519

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	91.72	95% Adjusted Gamma UCL (use when n<50)	146.9

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.892	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.186	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.715	Mean of logged Data	0.523
Maximum of Logged Data	4.868	SD of logged Data	2.157

Assuming Lognormal Distribution

95% H-UCL	3706	90% Chebyshev (MVUE) UCL	29.69
95% Chebyshev (MVUE) UCL	38.88	97.5% Chebyshev (MVUE) UCL	51.62
99% Chebyshev (MVUE) UCL	76.67		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	44.22	95% Jackknife UCL	48.23
95% Standard Bootstrap UCL	42.49	95% Bootstrap-t UCL	524.5
95% Hall's Bootstrap UCL	456.5	95% Percentile Bootstrap UCL	49.45
95% BCA Bootstrap UCL	65.71		
90% Chebyshev(Mean, Sd) UCL	65.95	95% Chebyshev(Mean, Sd) UCL	87.74
97.5% Chebyshev(Mean, Sd) UCL	118	99% Chebyshev(Mean, Sd) UCL	177.4

Suggested UCL to Use

99% Chebyshev (Mean, Sd) UCL 177.4

Recommended UCL exceeds the maximum observation

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.14	Mean	1.809
Maximum	5.5	Median	1.55
SD	1.761	Std. Error of Mean	0.623
Coefficient of Variation	0.974	Skewness	1.421

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	2.988	95% Adjusted-CLT UCL (Chen-1995)	3.167
		95% Modified-t UCL (Johnson-1978)	3.04

Gamma GOF Test

A-D Test Statistic	0.208	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.147	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.04	k star (bias corrected MLE)	0.733
Theta hat (MLE)	1.739	Theta star (bias corrected MLE)	2.466
nu hat (MLE)	16.64	nu star (bias corrected)	11.73
MLE Mean (bias corrected)	1.809	MLE Sd (bias corrected)	2.112
		Approximate Chi Square Value (0.05)	5.053
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.001

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	4.201	95% Adjusted Gamma UCL (use when n<50)	5.304

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.194	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.966	Mean of logged Data	0.0402
Maximum of Logged Data	1.705	SD of logged Data	1.279

Assuming Lognormal Distribution

95% H-UCL	17.48	90% Chebyshev (MVUE) UCL	4.825
95% Chebyshev (MVUE) UCL	6.092	97.5% Chebyshev (MVUE) UCL	7.851
99% Chebyshev (MVUE) UCL	11.31		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	2.833	95% Jackknife UCL	2.988
95% Standard Bootstrap UCL	2.758	95% Bootstrap-t UCL	3.571
95% Hall's Bootstrap UCL	7.791	95% Percentile Bootstrap UCL	2.783
95% BCA Bootstrap UCL	3.113		
90% Chebyshev(Mean, Sd) UCL	3.676	95% Chebyshev(Mean, Sd) UCL	4.522
97.5% Chebyshev(Mean, Sd) UCL	5.697	99% Chebyshev(Mean, Sd) UCL	8.003

Suggested UCL to Use

95% Student's-t UCL	2.988

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.12	Minimum Non-Detect	43
Maximum Detect	1600	Maximum Non-Detect	43
Variance Detects	362510	Percent Non-Detects	12.5%
Mean Detects	234.7	SD Detects	602.1
Median Detects	9.5	CV Detects	2.565
Skewness Detects	2.645	Kurtosis Detects	6.996
Mean of Logged Detects	1.308	SD of Logged Detects	3.545

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.464	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.497	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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

KM Mean	206.3	KM Standard Error of Mean	201.2
KM SD	526.8	95% KM (BCA) UCL	605.9
95% KM (t) UCL	587.4	95% KM (Percentile Bootstrap) UCL	602.4
95% KM (z) UCL	537.2	95% KM Bootstrap t UCL	18391
90% KM Chebyshev UCL	809.8	95% KM Chebyshev UCL	1083
97.5% KM Chebyshev UCL	1463	99% KM Chebyshev UCL	2208

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.843	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.84	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.353	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.345	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)	0.18	k star (bias corrected MLE)	0.198
Theta hat (MLE)	1303	Theta star (bias corrected MLE)	1184
nu hat (MLE)	2.523	nu star (bias corrected)	2.775

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	234.7

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	205.4
Maximum	1600	Median	4.825
SD	563.6	CV	2.744
k hat (MLE)	0.16	k star (bias corrected MLE)	0.183
Theta hat (MLE)	1283	Theta star (bias corrected MLE)	1120
nu hat (MLE)	2.561	nu star (bias corrected)	2.934
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (2.93, α)	0.353	Adjusted Chi Square Value (2.93, β)	0.203
95% Gamma Approximate UCL (use when n>=50)	1706	95% Gamma Adjusted UCL (use when n<50)	2972

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	206.3	SD (KM)	526.8
Variance (KM)	277553	SE of Mean (KM)	201.2
k hat (KM)	0.153	k star (KM)	0.179
nu hat (KM)	2.452	nu star (KM)	2.866
theta hat (KM)	1346	theta star (KM)	1151
80% gamma percentile (KM)	255.1	90% gamma percentile (KM)	621.9
95% gamma percentile (KM)	1092	99% gamma percentile (KM)	2412

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.87, α)	0.334	Adjusted Chi Square Value (2.87, β)	0.192
95% Gamma Approximate KM-UCL (use when n>=50)	1771	95% Gamma Adjusted KM-UCL (use when n<50)	3085

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	205.6	Mean in Log Scale	1.207
SD in Original Scale	563.5	SD in Log Scale	3.295
95% t UCL (assumes normality of ROS data)	583	95% Percentile Bootstrap UCL	602.6
95% BCA Bootstrap UCL	800.3	95% Bootstrap t UCL	18622
95% H-UCL (Log ROS)	1.639E+8		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.181	KM Geo Mean	3.259
KM SD (logged)	3.196	95% Critical H Value (KM-Log)	9.575
KM Standard Error of Mean (logged)	1.267	95% H-UCL (KM -Log)	56811736
KM SD (logged)	3.196	95% Critical H Value (KM-Log)	9.575
KM Standard Error of Mean (logged)	1.267		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	208.1	Mean in Log Scale	1.528
SD in Original Scale	562.5	SD in Log Scale	3.341
95% t UCL (Assumes normality)	584.8	95% H-Stat UCL	3.706E+8

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

99% KM (Chebyshev) UCL 2208

Warning: Recommended UCL exceeds the maximum observation

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-BHC (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-01) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.091	Minimum Non-Detect	0.025
Maximum Detect	1.1	Maximum Non-Detect	0.12
Variance Detects	0.509	Percent Non-Detects	71.43%
Mean Detects	0.596	SD Detects	0.713
Median Detects	0.596	CV Detects	1.198
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.151	SD of Logged Detects	1.762

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.193	KM Standard Error of Mean	0.199
KM SD	0.371	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.579	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.52	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.789	95% KM Chebyshev UCL	1.059
97.5% KM Chebyshev UCL	1.434	99% KM Chebyshev UCL	2.17

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.922	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.646	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.687	nu star (bias corrected)	N/A
Mean (detects)	0.596		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.193	SD (KM)	0.371
Variance (KM)	0.138	SE of Mean (KM)	0.199
k hat (KM)	0.269	k star (KM)	0.249
nu hat (KM)	3.771	nu star (KM)	3.488
theta hat (KM)	0.716	theta star (KM)	0.774
80% gamma percentile (KM)	0.28	90% gamma percentile (KM)	0.579
95% gamma percentile (KM)	0.934	99% gamma percentile (KM)	1.88

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (3.49, α)	0.531	Adjusted Chi Square Value (3.49, β)	0.281
95% Gamma Approximate KM-UCL (use when n>=50)	1.267	95% Gamma Adjusted KM-UCL (use when n<50)	2.394

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	0.174	Mean in Log Scale	-4.359
SD in Original Scale	0.41	SD in Log Scale	2.435
95% t UCL (assumes normality of ROS data)	0.475	95% Percentile Bootstrap UCL	0.475
95% BCA Bootstrap UCL	0.632	95% Bootstrap t UCL	11.05
95% H-UCL (Log ROS)	801.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.871	KM Geo Mean	0.0566
KM SD (logged)	1.317	95% Critical H Value (KM-Log)	4.627
KM Standard Error of Mean (logged)	0.731	95% H-UCL (KM -Log)	1.623
KM SD (logged)	1.317	95% Critical H Value (KM-Log)	4.627
KM Standard Error of Mean (logged)	0.731		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.196	Mean in Log Scale	-2.831
SD in Original Scale	0.4	SD in Log Scale	1.464
95% t UCL (Assumes normality)	0.489	95% H-Stat UCL	3.569

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

975% KM (Chebyshev) UCL 1.434

Warning: Recommended UCL exceeds the maximum observation

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-BHC (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.076	Minimum Non-Detect	0.012
Maximum Detect	0.16	Maximum Non-Detect	0.11
Variance Detects	0.00225	Percent Non-Detects	62.5%
Mean Detects	0.105	SD Detects	0.0474
Median Detects	0.08	CV Detects	0.45
Skewness Detects	1.718	Kurtosis Detects	N/A
Mean of Logged Detects	-2.312	SD of Logged Detects	0.416

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.786	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.37	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0536	KM Standard Error of Mean	0.0233
KM SD	0.0503	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0978	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.092	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.124	95% KM Chebyshev UCL	0.155

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

97.5% KM Chebyshev UCL	0.199	99% KM Chebyshev UCL	0.286

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	8.34	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0126	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	50.04	nu star (bias corrected)	N/A
Mean (detects)	0.105		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.052
Maximum	0.16	Median	0.0351
SD	0.0533	CV	1.025
k hat (MLE)	1.058	k star (bias corrected MLE)	0.745
Theta hat (MLE)	0.0492	Theta star (bias corrected MLE)	0.0699
nu hat (MLE)	16.93	nu star (bias corrected)	11.92
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (11.92, α)	5.171	Adjusted Chi Square Value (11.92, β)	4.105
95% Gamma Approximate UCL (use when n>=50)	0.12	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0536	SD (KM)	0.0503
Variance (KM)	0.00253	SE of Mean (KM)	0.0233
k hat (KM)	1.134	k star (KM)	0.792
nu hat (KM)	18.14	nu star (KM)	12.67
theta hat (KM)	0.0473	theta star (KM)	0.0677
80% gamma percentile (KM)	0.0876	90% gamma percentile (KM)	0.131
95% gamma percentile (KM)	0.174	99% gamma percentile (KM)	0.278

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.67, α)	5.674	Adjusted Chi Square Value (12.67, β)	4.546
95% Gamma Approximate KM-UCL (use when n>=50)	0.12	95% Gamma Adjusted KM-UCL (use when n<50)	0.149

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.801	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.363	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0658	Mean in Log Scale	-2.865
SD in Original Scale	0.0424	SD in Log Scale	0.543
95% t UCL (assumes normality of ROS data)	0.0942	95% Percentile Bootstrap UCL	0.0913
95% BCA Bootstrap UCL	0.099	95% Bootstrap t UCL	0.122
95% H-UCL (Log ROS)	0.109		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.444	KM Geo Mean	0.0319
KM SD (logged)	1.052	95% Critical H Value (KM-Log)	3.555
KM Standard Error of Mean (logged)	0.513	95% H-UCL (KM -Log)	0.228
KM SD (logged)	1.052	95% Critical H Value (KM-Log)	3.555
KM Standard Error of Mean (logged)	0.513		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0581	Mean in Log Scale	-3.275
SD in Original Scale	0.0499	SD in Log Scale	1.116
95% t UCL (Assumes normality)	0.0916	95% H-Stat UCL	0.337

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 0.0978

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.022	Minimum Non-Detect	0.022
Maximum Detect	0.041	Maximum Non-Detect	0.21
Variance Detects	9.4333E-5	Percent Non-Detects	62.5%
Mean Detects	0.0303	SD Detects	0.00971
Median Detects	0.028	CV Detects	0.32
Skewness Detects	1.019	Kurtosis Detects	N/A
Mean of Logged Detects	-3.529	SD of Logged Detects	0.314

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0283	KM Standard Error of Mean	0.00475
KM SD	0.00776	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0373	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0361	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0425	95% KM Chebyshev UCL	0.049
97.5% KM Chebyshev UCL	0.0579	99% KM Chebyshev UCL	0.0755

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	15.18	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.002	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	91.06	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.0303

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0246
Maximum	0.041	Median	0.0238
SD	0.00936	CV	0.38
k hat (MLE)	7.075	k star (bias corrected MLE)	4.505
Theta hat (MLE)	0.00348	Theta star (bias corrected MLE)	0.00546
nu hat (MLE)	113.2	nu star (bias corrected)	72.08
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (72.08, α)	53.53	Adjusted Chi Square Value (72.08, β)	49.51
95% Gamma Approximate UCL (use when n>=50)	0.0331	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0283	SD (KM)	0.00776
Variance (KM)	6.0188E-5	SE of Mean (KM)	0.00475
k hat (KM)	13.26	k star (KM)	8.371
nu hat (KM)	212.2	nu star (KM)	133.9
theta hat (KM)	0.00213	theta star (KM)	0.00337
80% gamma percentile (KM)	0.036	90% gamma percentile (KM)	0.0413
95% gamma percentile (KM)	0.046	99% gamma percentile (KM)	0.0558

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (133.93, α)	108.2	Adjusted Chi Square Value (133.93, β)	102.3
95% Gamma Approximate KM-UCL (use when n>=50)	0.035	95% Gamma Adjusted KM-UCL (use when n<50)	0.037

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.983	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.025	Mean in Log Scale	-3.746
SD in Original Scale	0.00865	SD in Log Scale	0.365
95% t UCL (assumes normality of ROS data)	0.0308	95% Percentile Bootstrap UCL	0.0299
95% BCA Bootstrap UCL	0.03	95% Bootstrap t UCL	0.0315
95% H-UCL (Log ROS)	0.034		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.601	KM Geo Mean	0.0273
KM SD (logged)	0.255	95% Critical H Value (KM-Log)	2.003
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	0.0342
KM SD (logged)	0.255	95% Critical H Value (KM-Log)	2.003
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0342	Mean in Log Scale	-3.598
SD in Original Scale	0.0298	SD in Log Scale	0.654
95% t UCL (Assumes normality)	0.0542	95% H-Stat UCL	0.0651

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 0.0373

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-BHC (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-05) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 alpha-BHC (sts-06) was not processed!

alpha-BHC (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-07) was not processed!

alpha-BHC (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 alpha-BHC (sts-08) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.12	Minimum Non-Detect	0.002
Maximum Detect	0.61	Maximum Non-Detect	4.9
Variance Detects	0.12	Percent Non-Detects	75%
Mean Detects	0.365	SD Detects	0.346
Median Detects	0.365	CV Detects	0.949
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.307	SD of Logged Detects	1.15

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.128	KM Standard Error of Mean	0.128
KM SD	0.221	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.371	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.339	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.512	95% KM Chebyshev UCL	0.686
97.5% KM Chebyshev UCL	0.928	99% KM Chebyshev UCL	1.402

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.819	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.201	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.275	nu star (bias corrected)	N/A
Mean (detects)	0.365		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.128	SD (KM)	0.221
Variance (KM)	0.0487	SE of Mean (KM)	0.128
k hat (KM)	0.336	k star (KM)	0.294
nu hat (KM)	5.381	nu star (KM)	4.696
theta hat (KM)	0.38	theta star (KM)	0.436
80% gamma percentile (KM)	0.195	90% gamma percentile (KM)	0.378
95% gamma percentile (KM)	0.589	99% gamma percentile (KM)	1.139

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (4.70, α)	1.015	Adjusted Chi Square Value (4.70, β)	0.652
95% Gamma Approximate KM-UCL (use when n>=50)	0.592	95% Gamma Adjusted KM-UCL (use when n<50)	0.921

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	0.107	Mean in Log Scale	-3.321
SD in Original Scale	0.207	SD in Log Scale	1.385
95% t UCL (assumes normality of ROS data)	0.245	95% Percentile Bootstrap UCL	0.242
95% BCA Bootstrap UCL	0.311	95% Bootstrap t UCL	1.87
95% H-UCL (Log ROS)	0.958		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.408	KM Geo Mean	0.0122
KM SD (logged)	2.384	95% Critical H Value (KM-Log)	7.229
KM Standard Error of Mean (logged)	1.453	95% H-UCL (KM -Log)	140.7
KM SD (logged)	2.384	95% Critical H Value (KM-Log)	7.229
KM Standard Error of Mean (logged)	1.453		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.55	Mean in Log Scale	-2.973
SD in Original Scale	0.861	SD in Log Scale	3.238
95% t UCL (Assumes normality)	1.127	95% H-Stat UCL	1383875

DL/2 is not a recommended method, provided for comparisons and historical reasons

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.686

Warning: Recommended UCL exceeds the maximum observation

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 (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.14	Minimum Non-Detect	0.019
Maximum Detect	0.22	Maximum Non-Detect	0.12
Variance Detects	0.0032	Percent Non-Detects	75%
Mean Detects	0.18	SD Detects	0.0566
Median Detects	0.18	CV Detects	0.314
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.74	SD of Logged Detects	0.32

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.0593	KM Standard Error of Mean	0.0363
KM SD	0.0725	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.128	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.119	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.168	95% KM Chebyshev UCL	0.217
97.5% KM Chebyshev UCL	0.286	99% KM Chebyshev UCL	0.42

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	19.91	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00904	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	79.64	nu star (bias corrected)	N/A
Mean (detects)	0.18		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0593	SD (KM)	0.0725
Variance (KM)	0.00526	SE of Mean (KM)	0.0363
k hat (KM)	0.667	k star (KM)	0.5
nu hat (KM)	10.68	nu star (KM)	8.007
theta hat (KM)	0.0888	theta star (KM)	0.118
80% gamma percentile (KM)	0.0973	90% gamma percentile (KM)	0.16
95% gamma percentile (KM)	0.228	99% gamma percentile (KM)	0.393

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (8.01, α)	2.739	Adjusted Chi Square Value (8.01, β)	2.023
95% Gamma Approximate KM-UCL (use when n>=50)	0.173	95% Gamma Adjusted KM-UCL (use when n<50)	0.234

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	0.0713	Mean in Log Scale	-2.964
SD in Original Scale	0.0707	SD in Log Scale	0.79
95% t UCL (assumes normality of ROS data)	0.119	95% Percentile Bootstrap UCL	0.116
95% BCA Bootstrap UCL	0.119	95% Bootstrap t UCL	0.39
95% H-UCL (Log ROS)	0.169		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.408	KM Geo Mean	0.0331
KM SD (logged)	0.969	95% Critical H Value (KM-Log)	3.351
KM Standard Error of Mean (logged)	0.485	95% H-UCL (KM -Log)	0.181
KM SD (logged)	0.969	95% Critical H Value (KM-Log)	3.351
KM Standard Error of Mean (logged)	0.485		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0718	Mean in Log Scale	-3.126
SD in Original Scale	0.0729	SD in Log Scale	1.121
95% t UCL (Assumes normality)	0.121	95% H-Stat UCL	0.399

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Data do not follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL	0.128	KM H-UCL	0.181
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.

alpha-Chlordane (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 alpha-Chlordane (sts-02) was not processed!

alpha-Chlordane (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.037	Minimum Non-Detect	0.012
Maximum Detect	0.2	Maximum Non-Detect	0.11
Variance Detects	0.0133	Percent Non-Detects	75%
Mean Detects	0.119	SD Detects	0.115
Median Detects	0.119	CV Detects	0.973
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.453	SD of Logged Detects	1.193

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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

KM Mean	0.0428	KM Standard Error of Mean	0.0309
KM SD	0.0604	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.101	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0936	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.135	95% KM Chebyshev UCL	0.177
97.5% KM Chebyshev UCL	0.236	99% KM Chebyshev UCL	0.35

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.709	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0693	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.835	nu star (bias corrected)	N/A
Mean (detects)	0.119		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0428	SD (KM)	0.0604
Variance (KM)	0.00365	SE of Mean (KM)	0.0309
k hat (KM)	0.501	k star (KM)	0.397
nu hat (KM)	8.022	nu star (KM)	6.347
theta hat (KM)	0.0853	theta star (KM)	0.108
80% gamma percentile (KM)	0.069	90% gamma percentile (KM)	0.121
95% gamma percentile (KM)	0.178	99% gamma percentile (KM)	0.322

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (6.35, α)	1.82	Adjusted Chi Square Value (6.35, β)	1.273
95% Gamma Approximate KM-UCL (use when n>=50)	0.149	95% Gamma Adjusted KM-UCL (use when n<50)	0.213

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	0.0358	Mean in Log Scale	-4.321
SD in Original Scale	0.0673	SD in Log Scale	1.328
95% t UCL (assumes normality of ROS data)	0.0808	95% Percentile Bootstrap UCL	0.0819
95% BCA Bootstrap UCL	0.104	95% Bootstrap t UCL	0.44
95% H-UCL (Log ROS)	0.275		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.743	KM Geo Mean	0.0237
KM SD (logged)	0.947	95% Critical H Value (KM-Log)	3.296
KM Standard Error of Mean (logged)	0.553	95% H-UCL (KM -Log)	0.121
KM SD (logged)	0.947	95% Critical H Value (KM-Log)	3.296
KM Standard Error of Mean (logged)	0.553		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0509	Mean in Log Scale	-3.505
SD in Original Scale	0.063	SD in Log Scale	1.088
95% t UCL (Assumes normality)	0.0931	95% H-Stat UCL	0.243

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 (Chebyshev) UCL	0.177

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 (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.045	Minimum Non-Detect	0.021
Maximum Detect	0.047	Maximum Non-Detect	0.21
Variance Detects	2.0000E-6	Percent Non-Detects	75%
Mean Detects	0.046	SD Detects	0.00141
Median Detects	0.046	CV Detects	0.0307
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-3.079	SD of Logged Detects	0.0307

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

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

KM Mean	0.0288	KM Standard Error of Mean	0.00654
KM SD	0.0116	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0412	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0396	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0485	95% KM Chebyshev UCL	0.0573
97.5% KM Chebyshev UCL	0.0697	99% KM Chebyshev UCL	0.0939

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2116	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.1743E-5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8463	nu star (bias corrected)	N/A
Mean (detects)	0.046		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0288	SD (KM)	0.0116
Variance (KM)	1.3403E-4	SE of Mean (KM)	0.00654
k hat (KM)	6.201	k star (KM)	3.959
nu hat (KM)	99.21	nu star (KM)	63.34
theta hat (KM)	0.00465	theta star (KM)	0.00728
80% gamma percentile (KM)	0.0398	90% gamma percentile (KM)	0.0483
95% gamma percentile (KM)	0.056	99% gamma percentile (KM)	0.0727

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (63.34, α)	46.03	Adjusted Chi Square Value (63.34, β)	42.33
95% Gamma Approximate KM-UCL (use when n>=50)	0.0397	95% Gamma Adjusted KM-UCL (use when n<50)	0.0431

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	0.0432	Mean in Log Scale	-3.143
SD in Original Scale	0.00185	SD in Log Scale	0.0418
95% t UCL (assumes normality of ROS data)	0.0444	95% Percentile Bootstrap UCL	0.0443
95% BCA Bootstrap UCL	0.0446	95% Bootstrap t UCL	0.0468

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% H-UCL (Log ROS)	N/A

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.617	KM Geo Mean	0.0268
KM SD (logged)	0.363	95% Critical H Value (KM-Log)	2.142
KM Standard Error of Mean (logged)	0.206	95% H-UCL (KM -Log)	0.0385
KM SD (logged)	0.363	95% Critical H Value (KM-Log)	2.142
KM Standard Error of Mean (logged)	0.206		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0344	Mean in Log Scale	-3.692
SD in Original Scale	0.032	SD in Log Scale	0.833
95% t UCL (Assumes normality)	0.0558	95% H-Stat UCL	0.0915

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL	0.0412	KM H-UCL	0.0385
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.

alpha-Chlordane (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-Chlordane (sts-05) was not processed!

alpha-Chlordane (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.84	Minimum Non-Detect	0.044
Maximum Detect	1.2	Maximum Non-Detect	0.2
Variance Detects	0.0648	Percent Non-Detects	75%
Mean Detects	1.02	SD Detects	0.255
Median Detects	1.02	CV Detects	0.25
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.00398	SD of Logged Detects	0.252

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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).

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.288	KM Standard Error of Mean	0.216
KM SD	0.432	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.697	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.643	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.936	95% KM Chebyshev UCL	1.23
97.5% KM Chebyshev UCL	1.637	99% KM Chebyshev UCL	2.438

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	31.77	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0321	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	127.1	nu star (bias corrected)	N/A
Mean (detects)	1.02		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.288	SD (KM)	0.432
Variance (KM)	0.187	SE of Mean (KM)	0.216
k hat (KM)	0.444	k star (KM)	0.361
nu hat (KM)	7.108	nu star (KM)	5.776
theta hat (KM)	0.648	theta star (KM)	0.798
80% gamma percentile (KM)	0.458	90% gamma percentile (KM)	0.828
95% gamma percentile (KM)	1.239	99% gamma percentile (KM)	2.286

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (5.78, α)	1.526	Adjusted Chi Square Value (5.78, β)	1.042
95% Gamma Approximate KM-UCL (use when n>=50)	1.09	95% Gamma Adjusted KM-UCL (use when n<50)	1.597

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	0.468	Mean in Log Scale	-0.968
SD in Original Scale	0.36	SD in Log Scale	0.653
95% t UCL (assumes normality of ROS data)	0.709	95% Percentile Bootstrap UCL	0.684
95% BCA Bootstrap UCL	0.712	95% Bootstrap t UCL	1.323
95% H-UCL (Log ROS)	0.902		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.342	KM Geo Mean	0.0962
KM SD (logged)	1.357	95% Critical H Value (KM-Log)	4.353
KM Standard Error of Mean (logged)	0.679	95% H-UCL (KM -Log)	2.253

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM SD (logged)	1.357	95% Critical H Value (KM-Log)	4.353
KM Standard Error of Mean (logged)	0.679		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.297	Mean in Log Scale	-2.226
SD in Original Scale	0.457	SD in Log Scale	1.439
95% t UCL (Assumes normality)	0.603	95% H-Stat UCL	3.665

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	0.697	KM H-UCL	2.253
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.

alpha-Chlordane (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.25	Minimum Non-Detect	0.012
Maximum Detect	11	Maximum Non-Detect	0.23
Variance Detects	57.78	Percent Non-Detects	75%
Mean Detects	5.625	SD Detects	7.601
Median Detects	5.625	CV Detects	1.351
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.506	SD of Logged Detects	2.676

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.415	KM Standard Error of Mean	1.812
KM SD	3.624	95% KM (BCA) UCL	N/A
95% KM (t) UCL	4.848	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	4.395	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	6.851	95% KM Chebyshev UCL	9.313
97.5% KM Chebyshev UCL	12.73	99% KM Chebyshev UCL	19.44

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.517	k star (bias corrected MLE)	N/A
Theta hat (MLE)	10.87	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.069	nu star (bias corrected)	N/A
Mean (detects)	5.625		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.415	SD (KM)	3.624
Variance (KM)	13.13	SE of Mean (KM)	1.812
k hat (KM)	0.153	k star (KM)	0.179
nu hat (KM)	2.441	nu star (KM)	2.859
theta hat (KM)	9.278	theta star (KM)	7.921
80% gamma percentile (KM)	1.748	90% gamma percentile (KM)	4.267
95% gamma percentile (KM)	7.5	99% gamma percentile (KM)	16.57

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (2.86, α)	0.332	Adjusted Chi Square Value (2.86, β)	0.19
95% Gamma Approximate KM-UCL (use when n>=50)	12.19	95% Gamma Adjusted KM-UCL (use when n<50)	21.24

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	1.406	Mean in Log Scale	-9.739
SD in Original Scale	3.877	SD in Log Scale	6.611
95% t UCL (assumes normality of ROS data)	4.004	95% Percentile Bootstrap UCL	4.125
95% BCA Bootstrap UCL	5.5	95% Bootstrap t UCL	429184
95% H-UCL (Log ROS)	3.192E+26		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.191	KM Geo Mean	0.0411
KM SD (logged)	2.334	95% Critical H Value (KM-Log)	7.087
KM Standard Error of Mean (logged)	1.167	95% H-UCL (KM -Log)	326.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM SD (logged)	2.334	95% Critical H Value (KM-Log)	7.087
KM Standard Error of Mean (logged)	1.167		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.442	Mean in Log Scale	-2.583
SD in Original Scale	3.863	SD in Log Scale	2.388
95% t UCL (Assumes normality)	4.029	95% H-Stat UCL	900

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

KM Bootstrap t UCL N/A

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 (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.058	Minimum Non-Detect	0.021
Maximum Detect	0.46	Maximum Non-Detect	0.21
Variance Detects	0.0808	Percent Non-Detects	75%
Mean Detects	0.259	SD Detects	0.284
Median Detects	0.259	CV Detects	1.098
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.812	SD of Logged Detects	1.464

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM Mean	0.084	KM Standard Error of Mean	0.0718
KM SD	0.143	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.22	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.202	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.299	95% KM Chebyshev UCL	0.397
97.5% KM Chebyshev UCL	0.532	99% KM Chebyshev UCL	0.798

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.224	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.212	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.898	nu star (bias corrected)	N/A
Mean (detects)	0.259		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.084	SD (KM)	0.143
Variance (KM)	0.0204	SE of Mean (KM)	0.0718
k hat (KM)	0.345	k star (KM)	0.299
nu hat (KM)	5.523	nu star (KM)	4.785
theta hat (KM)	0.243	theta star (KM)	0.281
80% gamma percentile (KM)	0.129	90% gamma percentile (KM)	0.248
95% gamma percentile (KM)	0.384	99% gamma percentile (KM)	0.74

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (4.79, α)	1.054	Adjusted Chi Square Value (4.79, β)	0.682
95% Gamma Approximate KM-UCL (use when n>=50)	0.381	95% Gamma Adjusted KM-UCL (use when n<50)	0.589

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	0.0681	Mean in Log Scale	-4.556
SD in Original Scale	0.159	SD in Log Scale	1.814
95% t UCL (assumes normality of ROS data)	0.175	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	2.553		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.255	KM Geo Mean	0.0386
KM SD (logged)	1.023	95% Critical H Value (KM-Log)	3.483
KM Standard Error of Mean (logged)	0.542	95% H-UCL (KM -Log)	0.25
KM SD (logged)	1.023	95% Critical H Value (KM-Log)	3.483

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM Standard Error of Mean (logged)	0.542

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.103	Mean in Log Scale	-2.995
SD in Original Scale	0.149	SD in Log Scale	1.276
95% t UCL (Assumes normality)	0.202	95% H-Stat UCL	0.828

DL/2 is not a recommended method, provided for comparisons and historical reasons

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.397

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.

alpha-Chlordane (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.0055	Mean	3.996
Maximum	23	Median	0.905
SD	7.825	Std. Error of Mean	2.767
Coefficient of Variation	1.958	Skewness	2.628

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.578	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.38	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	9.238	95% Adjusted-CLT UCL (Chen-1995)	11.29
		95% Modified-t UCL (Johnson-1978)	9.666

Gamma GOF Test

A-D Test Statistic	0.275	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.799	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.174	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.317	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	0.297	k star (bias corrected MLE)	0.269
Theta hat (MLE)	13.47	Theta star (bias corrected MLE)	14.87
nu hat (MLE)	4.746	nu star (bias corrected)	4.3
MLE Mean (bias corrected)	3.996	MLE Sd (bias corrected)	7.709
		Approximate Chi Square Value (0.05)	0.844
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.528

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	20.37	95% Adjusted Gamma UCL (use when n<50)	32.54

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.161	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-5.203	Mean of logged Data	-0.943
Maximum of Logged Data	3.135	SD of logged Data	3.003

Assuming Lognormal Distribution

95% H-UCL	980978	90% Chebyshev (MVUE) UCL	28.18
95% Chebyshev (MVUE) UCL	37.4	97.5% Chebyshev (MVUE) UCL	50.21
99% Chebyshev (MVUE) UCL	75.35		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	8.547	95% Jackknife UCL	9.238
95% Standard Bootstrap UCL	8.273	95% Bootstrap-t UCL	26.36
95% Hall's Bootstrap UCL	25.34	95% Percentile Bootstrap UCL	9.029
95% BCA Bootstrap UCL	11.51		
90% Chebyshev(Mean, Sd) UCL	12.3	95% Chebyshev(Mean, Sd) UCL	16.06
97.5% Chebyshev(Mean, Sd) UCL	21.27	99% Chebyshev(Mean, Sd) UCL	31.52

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% Adjusted Gamma UCL 32.54

Recommended UCL exceeds the maximum observation

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.

beta-BHC (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.051	Minimum Non-Detect	0.019
Maximum Detect	0.49	Maximum Non-Detect	0.11
Variance Detects	0.0335	Percent Non-Detects	37.5%
Mean Detects	0.278	SD Detects	0.183
Median Detects	0.22	CV Detects	0.657
Skewness Detects	0.0766	Kurtosis Detects	-1.931
Mean of Logged Detects	-1.537	SD of Logged Detects	0.905

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.225	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.182	KM Standard Error of Mean	0.0708
KM SD	0.179	95% KM (BCA) UCL	0.296
95% KM (t) UCL	0.317	95% KM (Percentile Bootstrap) UCL	0.296
95% KM (z) UCL	0.299	95% KM Bootstrap t UCL	0.313
90% KM Chebyshev UCL	0.395	95% KM Chebyshev UCL	0.491
97.5% KM Chebyshev UCL	0.625	99% KM Chebyshev UCL	0.887

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.322	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.227	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.36	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)	2.092	k star (bias corrected MLE)	0.97
Theta hat (MLE)	0.133	Theta star (bias corrected MLE)	0.287
nu hat (MLE)	20.92	nu star (bias corrected)	9.703
Mean (detects)	0.278		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.178
Maximum	0.49	Median	0.121
SD	0.196	CV	1.103
k hat (MLE)	0.638	k star (bias corrected MLE)	0.482
Theta hat (MLE)	0.278	Theta star (bias corrected MLE)	0.368
nu hat (MLE)	10.21	nu star (bias corrected)	7.715
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (7.72, α)	2.571	Adjusted Chi Square Value (7.72, β)	1.884
95% Gamma Approximate UCL (use when n>=50)	0.533	95% Gamma Adjusted UCL (use when n<50)	0.727

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.182	SD (KM)	0.179
Variance (KM)	0.0321	SE of Mean (KM)	0.0708
k hat (KM)	1.036	k star (KM)	0.731
nu hat (KM)	16.58	nu star (KM)	11.7
theta hat (KM)	0.176	theta star (KM)	0.249
80% gamma percentile (KM)	0.299	90% gamma percentile (KM)	0.453
95% gamma percentile (KM)	0.611	99% gamma percentile (KM)	0.987

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.70, α)	5.027	Adjusted Chi Square Value (11.70, β)	3.979
95% Gamma Approximate KM-UCL (use when n>=50)	0.424	95% Gamma Adjusted KM-UCL (use when n<50)	0.536

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	0.184	Mean in Log Scale	-2.334
SD in Original Scale	0.19	SD in Log Scale	1.302
95% t UCL (assumes normality of ROS data)	0.311	95% Percentile Bootstrap UCL	0.293
95% BCA Bootstrap UCL	0.299	95% Bootstrap t UCL	0.376
95% H-UCL (Log ROS)	1.795		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.406	KM Geo Mean	0.0902
KM SD (logged)	1.305	95% Critical H Value (KM-Log)	4.214
KM Standard Error of Mean (logged)	0.521	95% H-UCL (KM -Log)	1.69
KM SD (logged)	1.305	95% Critical H Value (KM-Log)	4.214
KM Standard Error of Mean (logged)	0.521		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.183	Mean in Log Scale	-2.469
SD in Original Scale	0.191	SD in Log Scale	1.547
95% t UCL (Assumes normality)	0.311	95% H-Stat UCL	4.835

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	0.317

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

beta-BHC (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	3
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.26	Minimum Non-Detect	0.025
Maximum Detect	99	Maximum Non-Detect	0.12
Variance Detects	2434	Percent Non-Detects	42.86%
Mean Detects	24.99	SD Detects	49.34
Median Detects	0.355	CV Detects	1.974
Skewness Detects	2	Kurtosis Detects	4
Mean of Logged Detects	0.286	SD of Logged Detects	2.88

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.631	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.441	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	14.29	KM Standard Error of Mean	15.09
KM SD	34.58	95% KM (BCA) UCL	N/A
95% KM (t) UCL	43.62	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	39.12	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	59.57	95% KM Chebyshev UCL	80.08
97.5% KM Chebyshev UCL	108.5	99% KM Chebyshev UCL	164.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.842	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.72	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.461	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.422	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)	0.243	k star (bias corrected MLE)	0.227
Theta hat (MLE)	102.7	Theta star (bias corrected MLE)	109.9
nu hat (MLE)	1.946	nu star (bias corrected)	1.82

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	24.99

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	14.29
Maximum	99	Median	0.26
SD	37.36	CV	2.615
k hat (MLE)	0.169	k star (bias corrected MLE)	0.192
Theta hat (MLE)	84.55	Theta star (bias corrected MLE)	74.49
nu hat (MLE)	2.365	nu star (bias corrected)	2.685
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (2.68, α)	0.286	Adjusted Chi Square Value (2.68, β)	0.148
95% Gamma Approximate UCL (use when n>=50)	134.3	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	14.29	SD (KM)	34.58
Variance (KM)	1196	SE of Mean (KM)	15.09
k hat (KM)	0.171	k star (KM)	0.193
nu hat (KM)	2.391	nu star (KM)	2.7
theta hat (KM)	83.68	theta star (KM)	74.11
80% gamma percentile (KM)	18.47	90% gamma percentile (KM)	43.21
95% gamma percentile (KM)	74.34	99% gamma percentile (KM)	160.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.70, α)	0.289	Adjusted Chi Square Value (2.70, β)	0.15
95% Gamma Approximate KM-UCL (use when n>=50)	133.4	95% Gamma Adjusted KM-UCL (use when n<50)	257.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.691	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.406	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	14.28	Mean in Log Scale	-2.922
SD in Original Scale	37.36	SD in Log Scale	4.489
95% t UCL (assumes normality of ROS data)	41.72	95% Percentile Bootstrap UCL	42.49
95% BCA Bootstrap UCL	42.57	95% Bootstrap t UCL	3971
95% H-UCL (Log ROS)	7.209E+14		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.418	KM Geo Mean	0.242
KM SD (logged)	2.725	95% Critical H Value (KM-Log)	9.059
KM Standard Error of Mean (logged)	1.189	95% H-UCL (KM -Log)	235941
KM SD (logged)	2.725	95% Critical H Value (KM-Log)	9.059
KM Standard Error of Mean (logged)	1.189		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	14.3	Mean in Log Scale	-1.395
SD in Original Scale	37.35	SD in Log Scale	2.957
95% t UCL (Assumes normality)	41.73	95% H-Stat UCL	2728936

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

KM Bootstrap t UCL N/A

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.

beta-BHC (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.015	Minimum Non-Detect	0.021
Maximum Detect	1.4	Maximum Non-Detect	0.021
Variance Detects	0.324	Percent Non-Detects	12.5%
Mean Detects	0.564	SD Detects	0.569
Median Detects	0.31	CV Detects	1.01
Skewness Detects	0.844	Kurtosis Detects	-1.244
Mean of Logged Detects	-1.285	SD of Logged Detects	1.572

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.836	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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

KM Mean	0.495	KM Standard Error of Mean	0.201
KM SD	0.525	95% KM (BCA) UCL	0.816
95% KM (t) UCL	0.875	95% KM (Percentile Bootstrap) UCL	0.813
95% KM (z) UCL	0.825	95% KM Bootstrap t UCL	1.31
90% KM Chebyshev UCL	1.097	95% KM Chebyshev UCL	1.369
97.5% KM Chebyshev UCL	1.747	99% KM Chebyshev UCL	2.491

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.266	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.176	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.322	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)	0.83	k star (bias corrected MLE)	0.569
Theta hat (MLE)	0.679	Theta star (bias corrected MLE)	0.99
nu hat (MLE)	11.62	nu star (bias corrected)	7.973
Mean (detects)	0.564		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.494
Maximum	1.4	Median	0.235
SD	0.562	CV	1.137
k hat (MLE)	0.618	k star (bias corrected MLE)	0.47
Theta hat (MLE)	0.8	Theta star (bias corrected MLE)	1.053
nu hat (MLE)	9.886	nu star (bias corrected)	7.512
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (7.51, α)	2.456	Adjusted Chi Square Value (7.51, β)	1.789
95% Gamma Approximate UCL (use when n>=50)	1.512	95% Gamma Adjusted UCL (use when n<50)	2.076

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.495	SD (KM)	0.525
Variance (KM)	0.276	SE of Mean (KM)	0.201
k hat (KM)	0.888	k star (KM)	0.639
nu hat (KM)	14.21	nu star (KM)	10.22
theta hat (KM)	0.557	theta star (KM)	0.775
80% gamma percentile (KM)	0.815	90% gamma percentile (KM)	1.269
95% gamma percentile (KM)	1.742	99% gamma percentile (KM)	2.878

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.22, α)	4.078	Adjusted Chi Square Value (10.22, β)	3.157
95% Gamma Approximate KM-UCL (use when n>=50)	1.24	95% Gamma Adjusted KM-UCL (use when n<50)	1.602

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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	0.496	Mean in Log Scale	-1.603
SD in Original Scale	0.561	SD in Log Scale	1.711
95% t UCL (assumes normality of ROS data)	0.871	95% Percentile Bootstrap UCL	0.805
95% BCA Bootstrap UCL	0.866	95% Bootstrap t UCL	1.317
95% H-UCL (Log ROS)	27.17		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.649	KM Geo Mean	0.192
KM SD (logged)	1.668	95% Critical H Value (KM-Log)	5.204
KM Standard Error of Mean (logged)	0.637	95% H-UCL (KM -Log)	20.56
KM SD (logged)	1.668	95% Critical H Value (KM-Log)	5.204
KM Standard Error of Mean (logged)	0.637		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.494	Mean in Log Scale	-1.694
SD in Original Scale	0.562	SD in Log Scale	1.859
95% t UCL (Assumes normality)	0.871	95% H-Stat UCL	58.31

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.875

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.

beta-BHC (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.1	Minimum Non-Detect	0.043
Maximum Detect	0.46	Maximum Non-Detect	0.21
Variance Detects	0.021	Percent Non-Detects	37.5%
Mean Detects	0.206	SD Detects	0.145
Median Detects	0.17	CV Detects	0.704
Skewness Detects	2.003	Kurtosis Detects	4.225
Mean of Logged Detects	-1.733	SD of Logged Detects	0.578

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.737	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.398	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.153	KM Standard Error of Mean	0.0504
KM SD	0.126	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.249	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.236	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.305	95% KM Chebyshev UCL	0.373
97.5% KM Chebyshev UCL	0.468	99% KM Chebyshev UCL	0.655

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.569	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.682	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.364	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.359	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.431	k star (bias corrected MLE)	1.506
Theta hat (MLE)	0.06	Theta star (bias corrected MLE)	0.137
nu hat (MLE)	34.31	nu star (bias corrected)	15.06
Mean (detects)	0.206		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.142
Maximum	0.46	Median	0.115
SD	0.143	CV	1.007
k hat (MLE)	0.981	k star (bias corrected MLE)	0.696
Theta hat (MLE)	0.145	Theta star (bias corrected MLE)	0.204
nu hat (MLE)	15.69	nu star (bias corrected)	11.14
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (11.14, α)	4.665	Adjusted Chi Square Value (11.14, β)	3.664
95% Gamma Approximate UCL (use when n>=50)	0.338	95% Gamma Adjusted UCL (use when n<50)	0.431

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.153	SD (KM)	0.126
Variance (KM)	0.0159	SE of Mean (KM)	0.0504
k hat (KM)	1.477	k star (KM)	1.007
nu hat (KM)	23.64	nu star (KM)	16.11
theta hat (KM)	0.104	theta star (KM)	0.152
80% gamma percentile (KM)	0.246	90% gamma percentile (KM)	0.352
95% gamma percentile (KM)	0.458	99% gamma percentile (KM)	0.703

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (16.11, α)	8.037	Adjusted Chi Square Value (16.11, β)	6.647
95% Gamma Approximate KM-UCL (use when n>=50)	0.307	95% Gamma Adjusted KM-UCL (use when n<50)	0.371

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.871	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.327	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	0.154	Mean in Log Scale	-2.119
SD in Original Scale	0.132	SD in Log Scale	0.726
95% t UCL (assumes normality of ROS data)	0.243	95% Percentile Bootstrap UCL	0.24
95% BCA Bootstrap UCL	0.264	95% Bootstrap t UCL	0.342
95% H-UCL (Log ROS)	0.337		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.165	KM Geo Mean	0.115
KM SD (logged)	0.756	95% Critical H Value (KM-Log)	2.855
KM Standard Error of Mean (logged)	0.312	95% H-UCL (KM -Log)	0.346
KM SD (logged)	0.756	95% Critical H Value (KM-Log)	2.855
KM Standard Error of Mean (logged)	0.312		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.148	Mean in Log Scale	-2.313
SD in Original Scale	0.139	SD in Log Scale	1.03
95% t UCL (Assumes normality)	0.24	95% H-Stat UCL	0.656

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Adjusted Gamma UCL	0.371	95% GROS Adjusted Gamma UCL	0.431

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

beta-BHC (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	8
Minimum Detect	0.041	Minimum Non-Detect	0.01
Maximum Detect	0.12	Maximum Non-Detect	0.25
Variance Detects	0.00185	Percent Non-Detects	72.73%
Mean Detects	0.0903	SD Detects	0.043
Median Detects	0.11	CV Detects	0.476
Skewness Detects	-1.627	Kurtosis Detects	N/A
Mean of Logged Detects	-2.507	SD of Logged Detects	0.596

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	0.843	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.343	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0394	KM Standard Error of Mean	0.0177
KM SD	0.0422	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0715	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0685	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0925	95% KM Chebyshev UCL	0.117
97.5% KM Chebyshev UCL	0.15	99% KM Chebyshev UCL	0.216

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	5.015	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.018	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	30.09	nu star (bias corrected)	N/A
Mean (detects)	0.0903		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0331
Maximum	0.12	Median	0.01
SD	0.0416	CV	1.256
k hat (MLE)	1.073	k star (bias corrected MLE)	0.841
Theta hat (MLE)	0.0308	Theta star (bias corrected MLE)	0.0393
nu hat (MLE)	23.61	nu star (bias corrected)	18.5
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (18.50, α)	9.755	Adjusted Chi Square Value (18.50, β)	8.737
95% Gamma Approximate UCL (use when n>=50)	0.0628	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0394	SD (KM)	0.0422
Variance (KM)	0.00178	SE of Mean (KM)	0.0177
k hat (KM)	0.87	k star (KM)	0.693
nu hat (KM)	19.14	nu star (KM)	15.26
theta hat (KM)	0.0452	theta star (KM)	0.0568
80% gamma percentile (KM)	0.0647	90% gamma percentile (KM)	0.099
95% gamma percentile (KM)	0.134	99% gamma percentile (KM)	0.219

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.26, α)	7.441	Adjusted Chi Square Value (15.26, β)	6.57
95% Gamma Approximate KM-UCL (use when n>=50)	0.0807	95% Gamma Adjusted KM-UCL (use when n<50)	0.0914

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.81	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.359	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.0385	Mean in Log Scale	-3.585
SD in Original Scale	0.0387	SD in Log Scale	0.773
95% t UCL (assumes normality of ROS data)	0.0596	95% Percentile Bootstrap UCL	0.0578
95% BCA Bootstrap UCL	0.0629	95% Bootstrap t UCL	0.123
95% H-UCL (Log ROS)	0.0704		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.788	KM Geo Mean	0.0226
KM SD (logged)	1.022	95% Critical H Value (KM-Log)	3.041
KM Standard Error of Mean (logged)	0.459	95% H-UCL (KM -Log)	0.102
KM SD (logged)	1.022	95% Critical H Value (KM-Log)	3.041
KM Standard Error of Mean (logged)	0.459		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0591	Mean in Log Scale	-3.289
SD in Original Scale	0.0479	SD in Log Scale	1.142
95% t UCL (Assumes normality)	0.0853	95% H-Stat UCL	0.234

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 0.0715

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.

beta-BHC (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.047	Minimum Non-Detect	0.11
Maximum Detect	1.7	Maximum Non-Detect	0.2
Variance Detects	0.502	Percent Non-Detects	37.5%
Mean Detects	0.625	SD Detects	0.709
Median Detects	0.21	CV Detects	1.133
Skewness Detects	1.093	Kurtosis Detects	-0.384
Mean of Logged Detects	-1.172	SD of Logged Detects	1.444

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.839	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.321	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.412	KM Standard Error of Mean	0.226
KM SD	0.572	95% KM (BCA) UCL	0.843
95% KM (t) UCL	0.841	95% KM (Percentile Bootstrap) UCL	0.786
95% KM (z) UCL	0.785	95% KM Bootstrap t UCL	2.669
90% KM Chebyshev UCL	1.091	95% KM Chebyshev UCL	1.399
97.5% KM Chebyshev UCL	1.826	99% KM Chebyshev UCL	2.664

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.323	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.696	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.277	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.366	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)	0.839	k star (bias corrected MLE)	0.469
Theta hat (MLE)	0.745	Theta star (bias corrected MLE)	1.333
nu hat (MLE)	8.395	nu star (bias corrected)	4.691
Mean (detects)	0.625		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.395
Maximum	1.7	Median	0.109
SD	0.623	CV	1.58
k hat (MLE)	0.426	k star (bias corrected MLE)	0.35
Theta hat (MLE)	0.927	Theta star (bias corrected MLE)	1.129
nu hat (MLE)	6.814	nu star (bias corrected)	5.592
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.59, α)	1.435	Adjusted Chi Square Value (5.59, β)	0.971
95% Gamma Approximate UCL (use when n>=50)	1.538	95% Gamma Adjusted UCL (use when n<50)	2.273

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.412	SD (KM)	0.572
Variance (KM)	0.327	SE of Mean (KM)	0.226
k hat (KM)	0.52	k star (KM)	0.408
nu hat (KM)	8.312	nu star (KM)	6.528
theta hat (KM)	0.794	theta star (KM)	1.011
80% gamma percentile (KM)	0.667	90% gamma percentile (KM)	1.161
95% gamma percentile (KM)	1.702	99% gamma percentile (KM)	3.059

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.53, α)	1.916	Adjusted Chi Square Value (6.53, β)	1.35
95% Gamma Approximate KM-UCL (use when n>=50)	1.405	95% Gamma Adjusted KM-UCL (use when n<50)	1.994

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	0.409	Mean in Log Scale	-1.904
SD in Original Scale	0.614	SD in Log Scale	1.514
95% t UCL (assumes normality of ROS data)	0.82	95% Percentile Bootstrap UCL	0.78
95% BCA Bootstrap UCL	0.855	95% Bootstrap t UCL	3.012
95% H-UCL (Log ROS)	7.232		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.839	KM Geo Mean	0.159
KM SD (logged)	1.353	95% Critical H Value (KM-Log)	4.342
KM Standard Error of Mean (logged)	0.542	95% H-UCL (KM -Log)	3.66
KM SD (logged)	1.353	95% Critical H Value (KM-Log)	4.342
KM Standard Error of Mean (logged)	0.542		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.417	Mean in Log Scale	-1.745
SD in Original Scale	0.608	SD in Log Scale	1.361
95% t UCL (Assumes normality)	0.825	95% H-Stat UCL	4.154

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.841

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.

beta-BHC (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.021	Minimum Non-Detect	0.021
Maximum Detect	31	Maximum Non-Detect	0.23
Variance Detects	235.3	Percent Non-Detects	50%
Mean Detects	7.998	SD Detects	15.34
Median Detects	0.485	CV Detects	1.918
Skewness Detects	1.997	Kurtosis Detects	3.989
Mean of Logged Detects	-0.661	SD of Logged Detects	3.118

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.649	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.43	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	4.012	KM Standard Error of Mean	4.166
KM SD	10.2	95% KM (BCA) UCL	N/A
95% KM (t) UCL	11.9	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	10.86	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	16.51	95% KM Chebyshev UCL	22.17
97.5% KM Chebyshev UCL	30.03	99% KM Chebyshev UCL	45.46

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.407	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.317	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.421	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)	0.258	k star (bias corrected MLE)	0.231
Theta hat (MLE)	31.01	Theta star (bias corrected MLE)	34.6
nu hat (MLE)	2.063	nu star (bias corrected)	1.849
Mean (detects)	7.998		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.004
Maximum	31	Median	0.0155
SD	10.91	CV	2.725
k hat (MLE)	0.185	k star (bias corrected MLE)	0.199
Theta hat (MLE)	21.62	Theta star (bias corrected MLE)	20.11
nu hat (MLE)	2.964	nu star (bias corrected)	3.186
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.19, α)	0.429	Adjusted Chi Square Value (3.19, β)	0.249
95% Gamma Approximate UCL (use when n>=50)	29.7	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.012	SD (KM)	10.2
Variance (KM)	104.1	SE of Mean (KM)	4.166
k hat (KM)	0.155	k star (KM)	0.18
nu hat (KM)	2.474	nu star (KM)	2.879
theta hat (KM)	25.95	theta star (KM)	22.29
80% gamma percentile (KM)	4.977	90% gamma percentile (KM)	12.1
95% gamma percentile (KM)	21.23	99% gamma percentile (KM)	46.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.88, α)	0.338	Adjusted Chi Square Value (2.88, β)	0.194
95% Gamma Approximate KM-UCL (use when n>=50)	34.22	95% Gamma Adjusted KM-UCL (use when n<50)	59.62

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.188	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	4.001	Mean in Log Scale	-3.629
SD in Original Scale	10.91	SD in Log Scale	3.95
95% t UCL (assumes normality of ROS data)	11.31	95% Percentile Bootstrap UCL	11.65
95% BCA Bootstrap UCL	15.62	95% Bootstrap t UCL	982.7
95% H-UCL (Log ROS)	2.798E+9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.217	KM Geo Mean	0.109
KM SD (logged)	2.479	95% Critical H Value (KM-Log)	7.502
KM Standard Error of Mean (logged)	1.018	95% H-UCL (KM -Log)	2653
KM SD (logged)	2.479	95% Critical H Value (KM-Log)	7.502
KM Standard Error of Mean (logged)	1.018		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.02	Mean in Log Scale	-2.125
SD in Original Scale	10.91	SD in Log Scale	2.656
95% t UCL (Assumes normality)	11.32	95% H-Stat UCL	12626

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 Bootstrap t UCL	N/A	djusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	59.62

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.

beta-BHC (sts-08)

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 beta-BHC (sts-08) was not processed!

beta-BHC (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.0037	Minimum Non-Detect	0.0036
Maximum Detect	56	Maximum Non-Detect	2.2
Variance Detects	504.4	Percent Non-Detects	25%
Mean Detects	10.29	SD Detects	22.46
Median Detects	0.61	CV Detects	2.182
Skewness Detects	2.419	Kurtosis Detects	5.876
Mean of Logged Detects	-0.874	SD of Logged Detects	3.513

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.552	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.435	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	7.75	KM Standard Error of Mean	7.085
KM SD	18.29	95% KM (BCA) UCL	21.24
95% KM (t) UCL	21.17	95% KM (Percentile Bootstrap) UCL	21.15
95% KM (z) UCL	19.4	95% KM Bootstrap t UCL	364.6
90% KM Chebyshev UCL	29	95% KM Chebyshev UCL	38.63
97.5% KM Chebyshev UCL	51.99	99% KM Chebyshev UCL	78.24

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.328	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.793	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.212	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.362	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)	0.225	k star (bias corrected MLE)	0.224
Theta hat (MLE)	45.67	Theta star (bias corrected MLE)	45.99
nu hat (MLE)	2.704	nu star (bias corrected)	2.685
Mean (detects)	10.29		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0037	Mean	7.721
Maximum	56	Median	0.156
SD	19.57	CV	2.535
k hat (MLE)	0.192	k star (bias corrected MLE)	0.204
Theta hat (MLE)	40.15	Theta star (bias corrected MLE)	37.94
nu hat (MLE)	3.077	nu star (bias corrected)	3.256
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.26, α)	0.452	Adjusted Chi Square Value (3.26, β)	0.263
95% Gamma Approximate UCL (use when n>=50)	55.59	95% Gamma Adjusted UCL (use when n<50)	95.67

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	7.75	SD (KM)	18.29
Variance (KM)	334.6	SE of Mean (KM)	7.085
k hat (KM)	0.179	k star (KM)	0.196
nu hat (KM)	2.872	nu star (KM)	3.128
theta hat (KM)	43.18	theta star (KM)	39.64
80% gamma percentile (KM)	10.09	90% gamma percentile (KM)	23.43
95% gamma percentile (KM)	40.17	99% gamma percentile (KM)	86.41

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.13, α)	0.411	Adjusted Chi Square Value (3.13, β)	0.238
95% Gamma Approximate KM-UCL (use when n>=50)	58.93	95% Gamma Adjusted KM-UCL (use when n<50)	102.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.986	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.136	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	7.721	Mean in Log Scale	-2.222
SD in Original Scale	19.57	SD in Log Scale	4.112
95% t UCL (assumes normality of ROS data)	20.83	95% Percentile Bootstrap UCL	21.19
95% BCA Bootstrap UCL	28.68	95% Bootstrap t UCL	462.6
95% H-UCL (Log ROS)	9.395E+10		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.769	KM Geo Mean	0.171
KM SD (logged)	3.332	95% Critical H Value (KM-Log)	9.97
KM Standard Error of Mean (logged)	1.334	95% H-UCL (KM -Log)	12443217
KM SD (logged)	3.332	95% Critical H Value (KM-Log)	9.97
KM Standard Error of Mean (logged)	1.334		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.856	Mean in Log Scale	-1.434
SD in Original Scale	19.51	SD in Log Scale	3.582
95% t UCL (Assumes normality)	20.92	95% H-Stat UCL	2.832E+8

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 Bootstrap t UCL	364.6	djusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	102.1

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.

delta-BHC (sts-01)

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-01) was not processed!

delta-BHC (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 delta-BHC (sts-02) was not processed!

delta-BHC (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 delta-BHC (sts-03) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

delta-BHC (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-04) was not processed!

delta-BHC (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-05) was not processed!

delta-BHC (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-06) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

delta-BHC (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-07) was not processed!

delta-BHC (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-08) was not processed!

delta-BHC (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-09) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Dieldrin (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.098	Minimum Non-Detect	0.038
Maximum Detect	2.1	Maximum Non-Detect	0.23
Variance Detects	1.075	Percent Non-Detects	62.5%
Mean Detects	0.943	SD Detects	1.037
Median Detects	0.63	CV Detects	1.1
Skewness Detects	1.233	Kurtosis Detects	N/A
Mean of Logged Detects	-0.681	SD of Logged Detects	1.544

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.385	KM Standard Error of Mean	0.293
KM SD	0.675	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.939	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.866	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.262	95% KM Chebyshev UCL	1.66
97.5% KM Chebyshev UCL	2.212	99% KM Chebyshev UCL	3.296

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.936	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.008	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.613	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.943

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.36
Maximum	2.1	Median	0.01
SD	0.735	CV	2.043
k hat (MLE)	0.323	k star (bias corrected MLE)	0.285
Theta hat (MLE)	1.115	Theta star (bias corrected MLE)	1.262
nu hat (MLE)	5.164	nu star (bias corrected)	4.561
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.56, α)	0.955	Adjusted Chi Square Value (4.56, β)	0.609
95% Gamma Approximate UCL (use when n>=50)	1.718	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.385	SD (KM)	0.675
Variance (KM)	0.456	SE of Mean (KM)	0.293
k hat (KM)	0.325	k star (KM)	0.286
nu hat (KM)	5.195	nu star (KM)	4.58
theta hat (KM)	1.185	theta star (KM)	1.344
80% gamma percentile (KM)	0.583	90% gamma percentile (KM)	1.141
95% gamma percentile (KM)	1.787	99% gamma percentile (KM)	3.474

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.58, α)	0.963	Adjusted Chi Square Value (4.58, β)	0.615
95% Gamma Approximate KM-UCL (use when n>=50)	1.829	95% Gamma Adjusted KM-UCL (use when n<50)	2.866

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.985	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.223	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.361	Mean in Log Scale	-3.111
SD in Original Scale	0.734	SD in Log Scale	2.216
95% t UCL (assumes normality of ROS data)	0.853	95% Percentile Bootstrap UCL	0.806
95% BCA Bootstrap UCL	1.077	95% Bootstrap t UCL	8.275
95% H-UCL (Log ROS)	147.7		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.181	KM Geo Mean	0.113
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	4.54
KM Standard Error of Mean (logged)	0.64	95% H-UCL (KM -Log)	3.616
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	4.54
KM Standard Error of Mean (logged)	0.64		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.4	Mean in Log Scale	-2.059
SD in Original Scale	0.715	SD in Log Scale	1.574
95% t UCL (Assumes normality)	0.878	95% H-Stat UCL	8.323

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	0.939

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.

Dieldrin (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
Number of Detects	3	Number of Non-Detects	4
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.21	Minimum Non-Detect	0.05
Maximum Detect	0.56	Maximum Non-Detect	0.26
Variance Detects	0.031	Percent Non-Detects	57.14%
Mean Detects	0.373	SD Detects	0.176
Median Detects	0.35	CV Detects	0.472
Skewness Detects	0.586	Kurtosis Detects	N/A
Mean of Logged Detects	-1.063	SD of Logged Detects	0.491

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.987	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.219	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.204	KM Standard Error of Mean	0.0868
KM SD	0.18	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.372	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.347	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.464	95% KM Chebyshev UCL	0.582
97.5% KM Chebyshev UCL	0.746	99% KM Chebyshev UCL	1.067

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	6.56	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0569	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	39.36	nu star (bias corrected)	N/A
Mean (detects)	0.373		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.173
Maximum	0.56	Median	0.0347
SD	0.214	CV	1.237
k hat (MLE)	0.629	k star (bias corrected MLE)	0.454
Theta hat (MLE)	0.275	Theta star (bias corrected MLE)	0.38
nu hat (MLE)	8.801	nu star (bias corrected)	6.363
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (6.36, α)	1.828	Adjusted Chi Square Value (6.36, β)	1.188
95% Gamma Approximate UCL (use when n>=50)	0.601	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.204	SD (KM)	0.18
Variance (KM)	0.0325	SE of Mean (KM)	0.0868
k hat (KM)	1.28	k star (KM)	0.827
nu hat (KM)	17.92	nu star (KM)	11.57
theta hat (KM)	0.159	theta star (KM)	0.247
80% gamma percentile (KM)	0.332	90% gamma percentile (KM)	0.492
95% gamma percentile (KM)	0.653	99% gamma percentile (KM)	1.034

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.57, α)	4.947	Adjusted Chi Square Value (11.57, β)	3.724
95% Gamma Approximate KM-UCL (use when n>=50)	0.477	95% Gamma Adjusted KM-UCL (use when n<50)	0.633

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.999	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.219	Mean in Log Scale	-1.764
SD in Original Scale	0.177	SD in Log Scale	0.726
95% t UCL (assumes normality of ROS data)	0.349	95% Percentile Bootstrap UCL	0.327
95% BCA Bootstrap UCL	0.349	95% Bootstrap t UCL	0.628
95% H-UCL (Log ROS)	0.537		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.031	KM Geo Mean	0.131
KM SD (logged)	0.967	95% Critical H Value (KM-Log)	3.604
KM Standard Error of Mean (logged)	0.497	95% H-UCL (KM -Log)	0.868
KM SD (logged)	0.967	95% Critical H Value (KM-Log)	3.604
KM Standard Error of Mean (logged)	0.497		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.206	Mean in Log Scale	-2.009
SD in Original Scale	0.19	SD in Log Scale	1.083
95% t UCL (Assumes normality)	0.346	95% H-Stat UCL	1.371

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% KM (t) UCL 0.372

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.

Dieldrin (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.05	Minimum Non-Detect	0.024
Maximum Detect	0.63	Maximum Non-Detect	0.22
Variance Detects	0.0576	Percent Non-Detects	50%
Mean Detects	0.328	SD Detects	0.24
Median Detects	0.315	CV Detects	0.733
Skewness Detects	0.297	Kurtosis Detects	0.87
Mean of Logged Detects	-1.447	SD of Logged Detects	1.091

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.99	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.181	KM Standard Error of Mean	0.0851
KM SD	0.208	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.342	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.321	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.436	95% KM Chebyshev UCL	0.551
97.5% KM Chebyshev UCL	0.712	99% KM Chebyshev UCL	1.027

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.291	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.26	**Kolmogorov-Smirnov GOF**

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.658	k star (bias corrected MLE)	0.581
Theta hat (MLE)	0.198	Theta star (bias corrected MLE)	0.564
nu hat (MLE)	13.26	nu star (bias corrected)	4.649
Mean (detects)	0.328		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.169
Maximum	0.63	Median	0.03
SD	0.231	CV	1.371
k hat (MLE)	0.508	k star (bias corrected MLE)	0.401
Theta hat (MLE)	0.332	Theta star (bias corrected MLE)	0.421
nu hat (MLE)	8.131	nu star (bias corrected)	6.415
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.41, α)	1.855	Adjusted Chi Square Value (6.41, β)	1.302
95% Gamma Approximate UCL (use when n>=50)	0.583	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.181	SD (KM)	0.208
Variance (KM)	0.0433	SE of Mean (KM)	0.0851
k hat (KM)	0.754	k star (KM)	0.555
nu hat (KM)	12.07	nu star (KM)	8.875
theta hat (KM)	0.24	theta star (KM)	0.326
80% gamma percentile (KM)	0.298	90% gamma percentile (KM)	0.478
95% gamma percentile (KM)	0.669	99% gamma percentile (KM)	1.133

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.87, α)	3.252	Adjusted Chi Square Value (8.87, β)	2.453
95% Gamma Approximate KM-UCL (use when n>=50)	0.493	95% Gamma Adjusted KM-UCL (use when n<50)	0.654

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.3	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.176	Mean in Log Scale	-2.622
SD in Original Scale	0.226	SD in Log Scale	1.477
95% t UCL (assumes normality of ROS data)	0.327	95% Percentile Bootstrap UCL	0.31
95% BCA Bootstrap UCL	0.333	95% Bootstrap t UCL	0.478
95% H-UCL (Log ROS)	2.949		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.451	KM Geo Mean	0.0862
KM SD (logged)	1.231	95% Critical H Value (KM-Log)	4.019
KM Standard Error of Mean (logged)	0.523	95% H-UCL (KM -Log)	1.195
KM SD (logged)	1.231	95% Critical H Value (KM-Log)	4.019
KM Standard Error of Mean (logged)	0.523		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.19	Mean in Log Scale	-2.338
SD in Original Scale	0.217	SD in Log Scale	1.331
95% t UCL (Assumes normality)	0.335	95% H-Stat UCL	2.019

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	0.342

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.

Dieldrin (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.1	Minimum Non-Detect	0.043
Maximum Detect	6.1	Maximum Non-Detect	0.42
Variance Detects	7.034	Percent Non-Detects	37.5%
Mean Detects	1.358	SD Detects	2.652
Median Detects	0.18	CV Detects	1.953
Skewness Detects	2.23	Kurtosis Detects	4.979
Mean of Logged Detects	-1.137	SD of Logged Detects	1.712

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.58	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.454	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	0.876	KM Standard Error of Mean	0.781
KM SD	1.977	95% KM (BCA) UCL	N/A
95% KM (t) UCL	2.356	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.161	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	3.22	95% KM Chebyshev UCL	4.282
97.5% KM Chebyshev UCL	5.756	99% KM Chebyshev UCL	8.651

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.887	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.718	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.406	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.374	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)	0.448	k star (bias corrected MLE)	0.313
Theta hat (MLE)	3.031	Theta star (bias corrected MLE)	4.345
nu hat (MLE)	4.48	nu star (bias corrected)	3.125
Mean (detects)	1.358		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.853
Maximum	6.1	Median	0.1
SD	2.123	CV	2.49
k hat (MLE)	0.302	k star (bias corrected MLE)	0.272
Theta hat (MLE)	2.82	Theta star (bias corrected MLE)	3.131
nu hat (MLE)	4.838	nu star (bias corrected)	4.357
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.36, α)	0.868	Adjusted Chi Square Value (4.36, β)	0.545
95% Gamma Approximate UCL (use when n>=50)	4.281	95% Gamma Adjusted UCL (use when n<50)	6.812

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.876	SD (KM)	1.977
Variance (KM)	3.907	SE of Mean (KM)	0.781
k hat (KM)	0.196	k star (KM)	0.206
nu hat (KM)	3.14	nu star (KM)	3.296
theta hat (KM)	4.461	theta star (KM)	4.251
80% gamma percentile (KM)	1.171	90% gamma percentile (KM)	2.648
95% gamma percentile (KM)	4.477	99% gamma percentile (KM)	9.487

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.30, α)	0.465	Adjusted Chi Square Value (3.30, β)	0.271
95% Gamma Approximate KM-UCL (use when n>=50)	6.203	95% Gamma Adjusted KM-UCL (use when n<50)	10.65

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.77	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.308	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	0.859	Mean in Log Scale	-2.261
SD in Original Scale	2.12	SD in Log Scale	2.129
95% t UCL (assumes normality of ROS data)	2.279	95% Percentile Bootstrap UCL	2.344
95% BCA Bootstrap UCL	3.088	95% Bootstrap t UCL	28.33
95% H-UCL (Log ROS)	187.8		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.784	KM Geo Mean	0.168
KM SD (logged)	1.513	95% Critical H Value (KM-Log)	4.776
KM Standard Error of Mean (logged)	0.608	95% H-UCL (KM -Log)	8.091
KM SD (logged)	1.513	95% Critical H Value (KM-Log)	4.776
KM Standard Error of Mean (logged)	0.608		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.883	Mean in Log Scale	-1.78
SD in Original Scale	2.11	SD in Log Scale	1.69
95% t UCL (Assumes normality)	2.296	95% H-Stat UCL	20.27

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

97.5% KM (Chebyshev) UCL	5.756	99% KM (Chebyshev) UCL	8.651

Warning: Recommended UCL exceeds the maximum observation

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.

Dieldrin (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	8
Minimum Detect	0.032	Minimum Non-Detect	0.038
Maximum Detect	0.47	Maximum Non-Detect	0.5
Variance Detects	0.0576	Percent Non-Detects	72.73%
Mean Detects	0.194	SD Detects	0.24
Median Detects	0.081	CV Detects	1.235
Skewness Detects	1.651	Kurtosis Detects	N/A
Mean of Logged Detects	-2.237	SD of Logged Detects	1.365

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.833	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.348	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0846	KM Standard Error of Mean	0.0507
KM SD	0.13	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.176	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.168	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.237	95% KM Chebyshev UCL	0.306
97.5% KM Chebyshev UCL	0.401	99% KM Chebyshev UCL	0.589

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.968	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.201	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.808	nu star (bias corrected)	N/A
Mean (detects)	0.194		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0611
Maximum	0.47	Median	0.01
SD	0.137	CV	2.248
k hat (MLE)	0.564	k star (bias corrected MLE)	0.471
Theta hat (MLE)	0.108	Theta star (bias corrected MLE)	0.13
nu hat (MLE)	12.4	nu star (bias corrected)	10.35
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (10.35, α)	4.164	Adjusted Chi Square Value (10.35, β)	3.547
95% Gamma Approximate UCL (use when n>=50)	0.152	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0846	SD (KM)	0.13
Variance (KM)	0.0168	SE of Mean (KM)	0.0507
k hat (KM)	0.425	k star (KM)	0.37
nu hat (KM)	9.35	nu star (KM)	8.134
theta hat (KM)	0.199	theta star (KM)	0.229
80% gamma percentile (KM)	0.135	90% gamma percentile (KM)	0.242
95% gamma percentile (KM)	0.361	99% gamma percentile (KM)	0.663

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.13, α)	2.813	Adjusted Chi Square Value (8.13, β)	2.328
95% Gamma Approximate KM-UCL (use when n>=50)	0.245	95% Gamma Adjusted KM-UCL (use when n<50)	0.296

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.0772	Mean in Log Scale	-3.096
SD in Original Scale	0.131	SD in Log Scale	0.836
95% t UCL (assumes normality of ROS data)	0.149	95% Percentile Bootstrap UCL	0.156
95% BCA Bootstrap UCL	0.196	95% Bootstrap t UCL	1.182
95% H-UCL (Log ROS)	0.131		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.006	KM Geo Mean	0.0495
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	2.682
KM Standard Error of Mean (logged)	0.344	95% H-UCL (KM -Log)	0.141
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	2.682
KM Standard Error of Mean (logged)	0.344		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.125	Mean in Log Scale	-2.582
SD in Original Scale	0.138	SD in Log Scale	1.049
95% t UCL (Assumes normality)	0.201	95% H-Stat UCL	0.366

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% KM (t) UCL 0.176

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.

Dieldrin (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.24	Minimum Non-Detect	0.21
Maximum Detect	1.5	Maximum Non-Detect	0.41
Variance Detects	0.268	Percent Non-Detects	37.5%
Mean Detects	0.654	SD Detects	0.517
Median Detects	0.48	CV Detects	0.791
Skewness Detects	1.44	Kurtosis Detects	1.809
Mean of Logged Detects	-0.658	SD of Logged Detects	0.752

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	0.491	KM Standard Error of Mean	0.167
KM SD	0.422	95% KM (BCA) UCL	0.774
95% KM (t) UCL	0.807	95% KM (Percentile Bootstrap) UCL	0.764
95% KM (z) UCL	0.765	95% KM Bootstrap t UCL	1.233
90% KM Chebyshev UCL	0.992	95% KM Chebyshev UCL	1.219
97.5% KM Chebyshev UCL	1.534	99% KM Chebyshev UCL	2.153

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.3	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.214	**Kolmogorov-Smirnov GOF**

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	2.296	k star (bias corrected MLE)	1.052
Theta hat (MLE)	0.285	Theta star (bias corrected MLE)	0.622
nu hat (MLE)	22.96	nu star (bias corrected)	10.52
Mean (detects)	0.654		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.413
Maximum	1.5	Median	0.26
SD	0.514	CV	1.246
k hat (MLE)	0.506	k star (bias corrected MLE)	0.4
Theta hat (MLE)	0.815	Theta star (bias corrected MLE)	1.032
nu hat (MLE)	8.098	nu star (bias corrected)	6.394
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.39, α)	1.845	Adjusted Chi Square Value (6.39, β)	1.293
95% Gamma Approximate UCL (use when n>=50)	1.43	95% Gamma Adjusted UCL (use when n<50)	2.04

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.491	SD (KM)	0.422
Variance (KM)	0.178	SE of Mean (KM)	0.167
k hat (KM)	1.349	k star (KM)	0.926
nu hat (KM)	21.58	nu star (KM)	14.82
theta hat (KM)	0.364	theta star (KM)	0.53
80% gamma percentile (KM)	0.794	90% gamma percentile (KM)	1.151
95% gamma percentile (KM)	1.51	99% gamma percentile (KM)	2.349

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.82, α)	7.137	Adjusted Chi Square Value (14.82, β)	5.842
95% Gamma Approximate KM-UCL (use when n>=50)	1.019	95% Gamma Adjusted KM-UCL (use when n<50)	1.245

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.448	Mean in Log Scale	-1.273
SD in Original Scale	0.484	SD in Log Scale	1.04
95% t UCL (assumes normality of ROS data)	0.772	95% Percentile Bootstrap UCL	0.744
95% BCA Bootstrap UCL	0.819	95% Bootstrap t UCL	1.285
95% H-UCL (Log ROS)	1.921		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.983	KM Geo Mean	0.374
KM SD (logged)	0.68	95% Critical H Value (KM-Log)	2.693
KM Standard Error of Mean (logged)	0.269	95% H-UCL (KM -Log)	0.941
KM SD (logged)	0.68	95% Critical H Value (KM-Log)	2.693
KM Standard Error of Mean (logged)	0.269		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.462	Mean in Log Scale	-1.161
SD in Original Scale	0.473	SD in Log Scale	0.919
95% t UCL (Assumes normality)	0.779	95% H-Stat UCL	1.464

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 0.807

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Dieldrin (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.055	Minimum Non-Detect	0.024
Maximum Detect	24	Maximum Non-Detect	0.45
Variance Detects	181.7	Percent Non-Detects	62.5%
Mean Detects	8.452	SD Detects	13.48
Median Detects	1.3	CV Detects	1.595
Skewness Detects	1.715	Kurtosis Detects	N/A
Mean of Logged Detects	0.18	SD of Logged Detects	3.04

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.789	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.369	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	3.192	KM Standard Error of Mean	3.41
KM SD	7.875	95% KM (BCA) UCL	N/A
95% KM (t) UCL	9.653	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	8.801	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	13.42	95% KM Chebyshev UCL	18.06
97.5% KM Chebyshev UCL	24.49	99% KM Chebyshev UCL	37.12

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.345	k star (bias corrected MLE)	N/A
Theta hat (MLE)	24.51	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.069	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	8.452

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.176
Maximum	24	Median	0.01
SD	8.426	CV	2.653
k hat (MLE)	0.187	k star (bias corrected MLE)	0.2
Theta hat (MLE)	16.94	Theta star (bias corrected MLE)	15.84
nu hat (MLE)	2.999	nu star (bias corrected)	3.208
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.21, α)	0.436	Adjusted Chi Square Value (3.21, β)	0.253
95% Gamma Approximate UCL (use when n>=50)	23.34	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.192	SD (KM)	7.875
Variance (KM)	62.02	SE of Mean (KM)	3.41
k hat (KM)	0.164	k star (KM)	0.186
nu hat (KM)	2.629	nu star (KM)	2.976
theta hat (KM)	19.43	theta star (KM)	17.16
80% gamma percentile (KM)	4.04	90% gamma percentile (KM)	9.64
95% gamma percentile (KM)	16.75	99% gamma percentile (KM)	36.57

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.98, α)	0.365	Adjusted Chi Square Value (2.98, β)	0.21
95% Gamma Approximate KM-UCL (use when n>=50)	26	95% Gamma Adjusted KM-UCL (use when n<50)	45.26

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.999	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	3.173	Mean in Log Scale	-3.659
SD in Original Scale	8.427	SD in Log Scale	3.785
95% t UCL (assumes normality of ROS data)	8.818	95% Percentile Bootstrap UCL	9.013
95% BCA Bootstrap UCL	12.01	95% Bootstrap t UCL	1412
95% H-UCL (Log ROS)	3.455E+8		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.056	KM Geo Mean	0.128
KM SD (logged)	2.327	95% Critical H Value (KM-Log)	7.065
KM Standard Error of Mean (logged)	1.031	95% H-UCL (KM -Log)	957.5
KM SD (logged)	2.327	95% Critical H Value (KM-Log)	7.065
KM Standard Error of Mean (logged)	1.031		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.238	Mean in Log Scale	-1.642
SD in Original Scale	8.4	SD in Log Scale	2.408
95% t UCL (Assumes normality)	8.864	95% H-Stat UCL	2706

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	9.653

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.

Dieldrin (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.1	Minimum Non-Detect	0.043
Maximum Detect	0.53	Maximum Non-Detect	0.4
Variance Detects	0.0925	Percent Non-Detects	75%
Mean Detects	0.315	SD Detects	0.304
Median Detects	0.315	CV Detects	0.965
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.469	SD of Logged Detects	1.179

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.116	KM Standard Error of Mean	0.0797
KM SD	0.158	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.267	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.247	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.355	95% KM Chebyshev UCL	0.464
97.5% KM Chebyshev UCL	0.614	99% KM Chebyshev UCL	0.909

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.743	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.181	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.971	nu star (bias corrected)	N/A
Mean (detects)	0.315		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.116	SD (KM)	0.158
Variance (KM)	0.025	SE of Mean (KM)	0.0797
k hat (KM)	0.542	k star (KM)	0.422
nu hat (KM)	8.671	nu star (KM)	6.753
theta hat (KM)	0.215	theta star (KM)	0.276
80% gamma percentile (KM)	0.189	90% gamma percentile (KM)	0.325
95% gamma percentile (KM)	0.474	99% gamma percentile (KM)	0.847

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (6.75, α)	2.036	Adjusted Chi Square Value (6.75, β)	1.447
95% Gamma Approximate KM-UCL (use when n>=50)	0.386	95% Gamma Adjusted KM-UCL (use when n<50)	0.543

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	0.0886	Mean in Log Scale	-3.69
SD in Original Scale	0.181	SD in Log Scale	1.509
95% t UCL (assumes normality of ROS data)	0.21	95% Percentile Bootstrap UCL	0.207
95% BCA Bootstrap UCL	0.273	95% Bootstrap t UCL	3.057
95% H-UCL (Log ROS)	1.182		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.648	KM Geo Mean	0.0708
KM SD (logged)	0.834	95% Critical H Value (KM-Log)	3.03
KM Standard Error of Mean (logged)	0.443	95% H-UCL (KM -Log)	0.261
KM SD (logged)	0.834	95% Critical H Value (KM-Log)	3.03
KM Standard Error of Mean (logged)	0.443		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.143	Mean in Log Scale	-2.46
SD in Original Scale	0.167	SD in Log Scale	1.102
95% t UCL (Assumes normality)	0.255	95% H-Stat UCL	0.728

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 (Chebyshev) UCL	0.464

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.

Dieldrin (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.018	Minimum Non-Detect	0.41
Maximum Detect	29	Maximum Non-Detect	4.4
Variance Detects	130.3	Percent Non-Detects	25%
Mean Detects	6.729	SD Detects	11.41
Median Detects	1.2	CV Detects	1.696
Skewness Detects	2.041	Kurtosis Detects	4.138
Mean of Logged Detects	-0.168	SD of Logged Detects	2.849

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.686	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.349	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	5.114	KM Standard Error of Mean	3.661
KM SD	9.45	95% KM (BCA) UCL	11.4
95% KM (t) UCL	12.05	95% KM (Percentile Bootstrap) UCL	11.26
95% KM (z) UCL	11.14	95% KM Bootstrap t UCL	76.94
90% KM Chebyshev UCL	16.1	95% KM Chebyshev UCL	21.07
97.5% KM Chebyshev UCL	27.98	99% KM Chebyshev UCL	41.54

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.268	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.221	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.356	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)	0.328	k star (bias corrected MLE)	0.275
Theta hat (MLE)	20.53	Theta star (bias corrected MLE)	24.47
nu hat (MLE)	3.932	nu star (bias corrected)	3.299
Mean (detects)	6.729		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.049
Maximum	29	Median	0.578
SD	10.14	CV	2.007
k hat (MLE)	0.246	k star (bias corrected MLE)	0.237
Theta hat (MLE)	20.53	Theta star (bias corrected MLE)	21.3
nu hat (MLE)	3.934	nu star (bias corrected)	3.792
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.79, α)	0.641	Adjusted Chi Square Value (3.79, β)	0.387
95% Gamma Approximate UCL (use when n>=50)	29.85	95% Gamma Adjusted UCL (use when n<50)	49.5

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.114	SD (KM)	9.45
Variance (KM)	89.31	SE of Mean (KM)	3.661
k hat (KM)	0.293	k star (KM)	0.266
nu hat (KM)	4.685	nu star (KM)	4.262
theta hat (KM)	17.46	theta star (KM)	19.2
80% gamma percentile (KM)	7.586	90% gamma percentile (KM)	15.27
95% gamma percentile (KM)	24.28	99% gamma percentile (KM)	48.07

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.26, α)	0.828	Adjusted Chi Square Value (4.26, β)	0.517
95% Gamma Approximate KM-UCL (use when n>=50)	26.33	95% Gamma Adjusted KM-UCL (use when n<50)	42.18

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	5.071	Mean in Log Scale	-0.758
SD in Original Scale	10.12	SD in Log Scale	2.67
95% t UCL (assumes normality of ROS data)	11.85	95% Percentile Bootstrap UCL	11.2
95% BCA Bootstrap UCL	14.71	95% Bootstrap t UCL	87.13
95% H-UCL (Log ROS)	55733		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.809	KM Geo Mean	0.445
KM SD (logged)	2.626	95% Critical H Value (KM-Log)	7.926
KM Standard Error of Mean (logged)	1.06	95% H-UCL (KM -Log)	36549
KM SD (logged)	2.626	95% Critical H Value (KM-Log)	7.926
KM Standard Error of Mean (logged)	1.06		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.347	Mean in Log Scale	-0.225
SD in Original Scale	9.995	SD in Log Scale	2.492
95% t UCL (Assumes normality)	12.04	95% H-Stat UCL	21638

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM Bootstrap t UCL 76.94 ljusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 42.18

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.

gamma-BHC (Lindane) (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 gamma-BHC (Lindane) (sts-01) was not processed!

gamma-BHC (Lindane) (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.061	Minimum Non-Detect	0.025
Maximum Detect	0.99	Maximum Non-Detect	0.12
Variance Detects	0.432	Percent Non-Detects	71.43%
Mean Detects	0.526	SD Detects	0.657
Median Detects	0.526	CV Detects	1.25
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.403	SD of Logged Detects	1.971

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.171	KM Standard Error of Mean	0.179
KM SD	0.335	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.519	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.465	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.708	95% KM Chebyshev UCL	0.951
97.5% KM Chebyshev UCL	1.289	99% KM Chebyshev UCL	1.952

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.783	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.671	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.132	nu star (bias corrected)	N/A
Mean (detects)	0.526		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.171	SD (KM)	0.335
Variance (KM)	0.112	SE of Mean (KM)	0.179
k hat (KM)	0.259	k star (KM)	0.244
nu hat (KM)	3.633	nu star (KM)	3.409
theta hat (KM)	0.657	theta star (KM)	0.7
80% gamma percentile (KM)	0.245	90% gamma percentile (KM)	0.513
95% gamma percentile (KM)	0.832	99% gamma percentile (KM)	1.685

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (3.41, α)	0.503	Adjusted Chi Square Value (3.41, β)	0.265
95% Gamma Approximate KM-UCL (use when n>=50)	1.155	95% Gamma Adjusted KM-UCL (use when n<50)	2.196

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	0.152	Mean in Log Scale	-4.991
SD in Original Scale	0.37	SD in Log Scale	2.723
95% t UCL (assumes normality of ROS data)	0.424	95% Percentile Bootstrap UCL	0.426
95% BCA Bootstrap UCL	0.569	95% Bootstrap t UCL	15.13
95% H-UCL (Log ROS)	6483		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.972	KM Geo Mean	0.0512
KM SD (logged)	1.261	95% Critical H Value (KM-Log)	4.459
KM Standard Error of Mean (logged)	0.687	95% H-UCL (KM -Log)	1.126

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM SD (logged)	1.261	95% Critical H Value (KM-Log)	4.459
KM Standard Error of Mean (logged)	0.687		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.176	Mean in Log Scale	-2.903
SD in Original Scale	0.36	SD in Log Scale	1.416
95% t UCL (Assumes normality)	0.44	95% H-Stat UCL	2.577

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

975% KM (Chebyshev) UCL 1.289

Warning: Recommended UCL exceeds the maximum observation

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.

gamma-BHC (Lindane) (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.06	Minimum Non-Detect	0.012
Maximum Detect	0.11	Maximum Non-Detect	0.11
Variance Detects	0.00125	Percent Non-Detects	75%
Mean Detects	0.085	SD Detects	0.0354
Median Detects	0.085	CV Detects	0.416
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.51	SD of Logged Detects	0.429

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0327	KM Standard Error of Mean	0.0181
KM SD	0.0343	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0669	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0624	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0869	95% KM Chebyshev UCL	0.111
97.5% KM Chebyshev UCL	0.146	99% KM Chebyshev UCL	0.212

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	11.22	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00758	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	44.87	nu star (bias corrected)	N/A
Mean (detects)	0.085		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0327	SD (KM)	0.0343
Variance (KM)	0.00118	SE of Mean (KM)	0.0181
k hat (KM)	0.905	k star (KM)	0.649
nu hat (KM)	14.49	nu star (KM)	10.39
theta hat (KM)	0.0361	theta star (KM)	0.0503
80% gamma percentile (KM)	0.0538	90% gamma percentile (KM)	0.0834
95% gamma percentile (KM)	0.114	99% gamma percentile (KM)	0.188

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (10.39, α)	4.186	Adjusted Chi Square Value (10.39, β)	3.25
95% Gamma Approximate KM-UCL (use when n>=50)	0.081	95% Gamma Adjusted KM-UCL (use when n<50)	0.104

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	0.0397	Mean in Log Scale	-3.424
SD in Original Scale	0.0314	SD in Log Scale	0.615
95% t UCL (assumes normality of ROS data)	0.0607	95% Percentile Bootstrap UCL	0.0574
95% BCA Bootstrap UCL	0.0647	95% Bootstrap t UCL	0.13
95% H-UCL (Log ROS)	0.0714		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.864	KM Geo Mean	0.021
KM SD (logged)	0.869	95% Critical H Value (KM-Log)	3.11
KM Standard Error of Mean (logged)	0.474	95% H-UCL (KM -Log)	0.085

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM SD (logged)	0.869	95% Critical H Value (KM-Log)	3.11
KM Standard Error of Mean (logged)	0.474		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0425	Mean in Log Scale	-3.519
SD in Original Scale	0.0346	SD in Log Scale	0.986
95% t UCL (Assumes normality)	0.0657	95% H-Stat UCL	0.17

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	0.0669	KM H-UCL	0.085
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.

gamma-BHC (Lindane) (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 gamma-BHC (Lindane) (sts-04) was not processed!

gamma-BHC (Lindane) (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-05) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-BHC (Lindane) (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-06) was not processed!

gamma-BHC (Lindane) (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-07) was not processed!

gamma-BHC (Lindane) (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-08) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-BHC (Lindane) (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 gamma-BHC (Lindane) (sts-09) was not processed!

gamma-Chlordane (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.13	Minimum Non-Detect	0.019
Maximum Detect	0.2	Maximum Non-Detect	0.12
Variance Detects	0.00123	Percent Non-Detects	62.5%
Mean Detects	0.163	SD Detects	0.0351
Median Detects	0.16	CV Detects	0.215
Skewness Detects	0.423	Kurtosis Detects	N/A
Mean of Logged Detects	-1.827	SD of Logged Detects	0.215

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.993	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.204	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0731	KM Standard Error of Mean	0.0312
KM SD	0.072	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.132	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.124	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.167	95% KM Chebyshev UCL	0.209
97.5% KM Chebyshev UCL	0.268	99% KM Chebyshev UCL	0.384

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	32.53	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00502	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	195.2	nu star (bias corrected)	N/A
Mean (detects)	0.163		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0395	Mean	0.0859
Maximum	0.2	Median	0.0395
SD	0.0668	CV	0.777
k hat (MLE)	2.145	k star (bias corrected MLE)	1.424
Theta hat (MLE)	0.0401	Theta star (bias corrected MLE)	0.0603
nu hat (MLE)	34.32	nu star (bias corrected)	22.78
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (22.78, α)	12.93	Adjusted Chi Square Value (22.78, β)	11.1
95% Gamma Approximate UCL (use when n>=50)	0.151	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0731	SD (KM)	0.072
Variance (KM)	0.00519	SE of Mean (KM)	0.0312
k hat (KM)	1.03	k star (KM)	0.727
nu hat (KM)	16.48	nu star (KM)	11.63
theta hat (KM)	0.071	theta star (KM)	0.101
80% gamma percentile (KM)	0.12	90% gamma percentile (KM)	0.182
95% gamma percentile (KM)	0.246	99% gamma percentile (KM)	0.397

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.63, α)	4.987	Adjusted Chi Square Value (11.63, β)	3.944
95% Gamma Approximate KM-UCL (use when n>=50)	0.171	95% Gamma Adjusted KM-UCL (use when n<50)	0.216

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	1	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.106	Mean in Log Scale	-2.34
SD in Original Scale	0.0514	SD in Log Scale	0.44
95% t UCL (assumes normality of ROS data)	0.14	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.154		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.162	KM Geo Mean	0.0423
KM SD (logged)	1.04	95% Critical H Value (KM-Log)	3.524
KM Standard Error of Mean (logged)	0.45	95% H-UCL (KM -Log)	0.29
KM SD (logged)	1.04	95% Critical H Value (KM-Log)	3.524
KM Standard Error of Mean (logged)	0.45		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0811	Mean in Log Scale	-3.014
SD in Original Scale	0.0729	SD in Log Scale	1.186
95% t UCL (Assumes normality)	0.13	95% H-Stat UCL	0.57

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	0.132

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-Chlordane (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.055	Minimum Non-Detect	0.025
Maximum Detect	0.15	Maximum Non-Detect	0.13
Variance Detects	0.00451	Percent Non-Detects	71.43%
Mean Detects	0.103	SD Detects	0.0672
Median Detects	0.103	CV Detects	0.655
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.399	SD of Logged Detects	0.709

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.0514	KM Standard Error of Mean	0.0237
KM SD	0.0423	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0974	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0904	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.122	95% KM Chebyshev UCL	0.155
97.5% KM Chebyshev UCL	0.199	99% KM Chebyshev UCL	0.287

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	4.296	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0239	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	17.18	nu star (bias corrected)	N/A
Mean (detects)	0.103		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0514	SD (KM)	0.0423
Variance (KM)	0.00179	SE of Mean (KM)	0.0237
k hat (KM)	1.477	k star (KM)	0.939
nu hat (KM)	20.68	nu star (KM)	13.15
theta hat (KM)	0.0348	theta star (KM)	0.0548
80% gamma percentile (KM)	0.0832	90% gamma percentile (KM)	0.12
95% gamma percentile (KM)	0.158	99% gamma percentile (KM)	0.244

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (13.15, α)	5.993	Adjusted Chi Square Value (13.15, β)	4.617
95% Gamma Approximate KM-UCL (use when n>=50)	0.113	95% Gamma Adjusted KM-UCL (use when n<50)	0.146

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	0.0445	Mean in Log Scale	-3.479
SD in Original Scale	0.0487	SD in Log Scale	0.849
95% t UCL (assumes normality of ROS data)	0.0803	95% Percentile Bootstrap UCL	0.0761
95% BCA Bootstrap UCL	0.0924	95% Bootstrap t UCL	0.159
95% H-UCL (Log ROS)	0.138		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.208	KM Geo Mean	0.0405
KM SD (logged)	0.636	95% Critical H Value (KM-Log)	2.754
KM Standard Error of Mean (logged)	0.387	95% H-UCL (KM -Log)	0.101
KM SD (logged)	0.636	95% Critical H Value (KM-Log)	2.754
KM Standard Error of Mean (logged)	0.387		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.061	Mean in Log Scale	-3.036
SD in Original Scale	0.0441	SD in Log Scale	0.793
95% t UCL (Assumes normality)	0.0934	95% H-Stat UCL	0.182

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 (Chebyshev) UCL 0.155

Warning: Recommended UCL exceeds the maximum observation

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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.

gamma-Chlordane (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.029	Minimum Non-Detect	0.012
Maximum Detect	0.61	Maximum Non-Detect	0.11
Variance Detects	0.106	Percent Non-Detects	62.5%
Mean Detects	0.235	SD Detects	0.326
Median Detects	0.065	CV Detects	1.387
Skewness Detects	1.708	Kurtosis Detects	N/A
Mean of Logged Detects	-2.256	SD of Logged Detects	1.578

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.796	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.366	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.102	KM Standard Error of Mean	0.0837
KM SD	0.193	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.261	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.24	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.353	95% KM Chebyshev UCL	0.467
97.5% KM Chebyshev UCL	0.625	99% KM Chebyshev UCL	0.935

Gamma GOF Tests on Detected Observations Only

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.743	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.316	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.459	nu star (bias corrected)	N/A
Mean (detects)	0.235		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0943
Maximum	0.61	Median	0.01
SD	0.209	CV	2.221
k hat (MLE)	0.471	k star (bias corrected MLE)	0.377
Theta hat (MLE)	0.2	Theta star (bias corrected MLE)	0.25
nu hat (MLE)	7.53	nu star (bias corrected)	6.04
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.04, α)	1.66	Adjusted Chi Square Value (6.04, β)	1.147
95% Gamma Approximate UCL (use when n>=50)	0.343	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.102	SD (KM)	0.193
Variance (KM)	0.0372	SE of Mean (KM)	0.0837
k hat (KM)	0.28	k star (KM)	0.258
nu hat (KM)	4.473	nu star (KM)	4.129
theta hat (KM)	0.365	theta star (KM)	0.395
80% gamma percentile (KM)	0.15	90% gamma percentile (KM)	0.305
95% gamma percentile (KM)	0.489	99% gamma percentile (KM)	0.975

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.13, α)	0.773	Adjusted Chi Square Value (4.13, β)	0.478
95% Gamma Approximate KM-UCL (use when n>=50)	0.544	95% Gamma Adjusted KM-UCL (use when n<50)	0.881

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.286	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0953	Mean in Log Scale	-3.818
SD in Original Scale	0.209	SD in Log Scale	1.674
95% t UCL (assumes normality of ROS data)	0.235	95% Percentile Bootstrap UCL	0.24
95% BCA Bootstrap UCL	0.312	95% Bootstrap t UCL	1.557
95% H-UCL (Log ROS)	2.42		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.327	KM Geo Mean	0.0359
KM SD (logged)	1.225	95% Critical H Value (KM-Log)	4.002
KM Standard Error of Mean (logged)	0.586	95% H-UCL (KM -Log)	0.485
KM SD (logged)	1.225	95% Critical H Value (KM-Log)	4.002
KM Standard Error of Mean (logged)	0.586		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.108	Mean in Log Scale	-3.168
SD in Original Scale	0.204	SD in Log Scale	1.325
95% t UCL (Assumes normality)	0.245	95% H-Stat UCL	0.858

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 0.261

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-Chlordane (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.045	Minimum Non-Detect	0.022
Maximum Detect	0.12	Maximum Non-Detect	0.21
Variance Detects	0.00142	Percent Non-Detects	62.5%
Mean Detects	0.0843	SD Detects	0.0376
Median Detects	0.088	CV Detects	0.446
Skewness Detects	-0.434	Kurtosis Detects	N/A
Mean of Logged Detects	-2.551	SD of Logged Detects	0.501

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.993	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0495	KM Standard Error of Mean	0.017
KM SD	0.0365	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0817	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0775	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.101	95% KM Chebyshev UCL	0.124
97.5% KM Chebyshev UCL	0.156	99% KM Chebyshev UCL	0.219

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	6.604	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0128	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	39.63	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.0843

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0398
Maximum	0.12	Median	0.0177
SD	0.0423	CV	1.064
k hat (MLE)	1.149	k star (bias corrected MLE)	0.802
Theta hat (MLE)	0.0346	Theta star (bias corrected MLE)	0.0496
nu hat (MLE)	18.39	nu star (bias corrected)	12.83
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (12.83, α)	5.777	Adjusted Chi Square Value (12.83, β)	4.636
95% Gamma Approximate UCL (use when n>=50)	0.0884	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0495	SD (KM)	0.0365
Variance (KM)	0.00133	SE of Mean (KM)	0.017
k hat (KM)	1.844	k star (KM)	1.236
nu hat (KM)	29.51	nu star (KM)	19.78
theta hat (KM)	0.0269	theta star (KM)	0.0401
80% gamma percentile (KM)	0.0782	90% gamma percentile (KM)	0.108
95% gamma percentile (KM)	0.138	99% gamma percentile (KM)	0.205

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.78, α)	10.69	Adjusted Chi Square Value (19.78, β)	9.045
95% Gamma Approximate KM-UCL (use when n>=50)	0.0917	95% Gamma Adjusted KM-UCL (use when n<50)	0.108

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.261	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.0456	Mean in Log Scale	-3.35
SD in Original Scale	0.0382	SD in Log Scale	0.743
95% t UCL (assumes normality of ROS data)	0.0712	95% Percentile Bootstrap UCL	0.0671
95% BCA Bootstrap UCL	0.0731	95% Bootstrap t UCL	0.118
95% H-UCL (Log ROS)	0.102		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.249	KM Geo Mean	0.0388
KM SD (logged)	0.674	95% Critical H Value (KM-Log)	2.681
KM Standard Error of Mean (logged)	0.318	95% H-UCL (KM -Log)	0.0965
KM SD (logged)	0.674	95% Critical H Value (KM-Log)	2.681
KM Standard Error of Mean (logged)	0.318		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0532	Mean in Log Scale	-3.309
SD in Original Scale	0.0444	SD in Log Scale	0.971
95% t UCL (Assumes normality)	0.083	95% H-Stat UCL	0.201

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 0.0817

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.

gamma-Chlordane (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	10
Number of Distinct Detects	1	Number of Distinct Non-Detects	10

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 gamma-Chlordane (sts-05) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-Chlordane (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.12	Minimum Non-Detect	0.044
Maximum Detect	2.5	Maximum Non-Detect	0.2
Variance Detects	1.582	Percent Non-Detects	50%
Mean Detects	1.22	SD Detects	1.258
Median Detects	1.13	CV Detects	1.031
Skewness Detects	0.086	Kurtosis Detects	-5.496
Mean of Logged Detects	-0.574	SD of Logged Detects	1.626

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.81	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.637	KM Standard Error of Mean	0.395
KM SD	0.966	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.384	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.286	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.821	95% KM Chebyshev UCL	2.357
97.5% KM Chebyshev UCL	3.101	99% KM Chebyshev UCL	4.563

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.573	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.67	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.323	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.405	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)	0.772	k star (bias corrected MLE)	0.36
Theta hat (MLE)	1.58	Theta star (bias corrected MLE)	3.392
nu hat (MLE)	6.175	nu star (bias corrected)	2.877

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	1.22

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.615
Maximum	2.5	Median	0.065
SD	1.047	CV	1.703
k hat (MLE)	0.324	k star (bias corrected MLE)	0.286
Theta hat (MLE)	1.899	Theta star (bias corrected MLE)	2.153
nu hat (MLE)	5.181	nu star (bias corrected)	4.571
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.57, α)	0.96	Adjusted Chi Square Value (4.57, β)	0.612
95% Gamma Approximate UCL (use when n>=50)	2.93	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.637	SD (KM)	0.966
Variance (KM)	0.934	SE of Mean (KM)	0.395
k hat (KM)	0.434	k star (KM)	0.355
nu hat (KM)	6.948	nu star (KM)	5.676
theta hat (KM)	1.466	theta star (KM)	1.795
80% gamma percentile (KM)	1.011	90% gamma percentile (KM)	1.835
95% gamma percentile (KM)	2.757	99% gamma percentile (KM)	5.105

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.68, α)	1.476	Adjusted Chi Square Value (5.68, β)	1.003
95% Gamma Approximate KM-UCL (use when n>=50)	2.448	95% Gamma Adjusted KM-UCL (use when n<50)	3.604

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.8	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.291	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.618	Mean in Log Scale	-2.461
SD in Original Scale	1.045	SD in Log Scale	2.348
95% t UCL (assumes normality of ROS data)	1.318	95% Percentile Bootstrap UCL	1.205
95% BCA Bootstrap UCL	1.417	95% Bootstrap t UCL	10.64
95% H-UCL (Log ROS)	748.8		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.791	KM Geo Mean	0.167
KM SD (logged)	1.592	95% Critical H Value (KM-Log)	4.993
KM Standard Error of Mean (logged)	0.656	95% H-UCL (KM -Log)	11.93
KM SD (logged)	1.592	95% Critical H Value (KM-Log)	4.993
KM Standard Error of Mean (logged)	0.656		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.639	Mean in Log Scale	-1.777
SD in Original Scale	1.032	SD in Log Scale	1.719
95% t UCL (Assumes normality)	1.33	95% H-Stat UCL	23.87

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	1.384

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.

gamma-Chlordane (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.021	Minimum Non-Detect	0.021
Maximum Detect	17	Maximum Non-Detect	0.23
Variance Detects	94.65	Percent Non-Detects	62.5%
Mean Detects	5.767	SD Detects	9.729
Median Detects	0.28	CV Detects	1.687
Skewness Detects	1.731	Kurtosis Detects	N/A
Mean of Logged Detects	-0.768	SD of Logged Detects	3.377

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.761	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.38	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	2.176	KM Standard Error of Mean	2.426
KM SD	5.604	95% KM (BCA) UCL	N/A
95% KM (t) UCL	6.773	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	6.167	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	9.455	95% KM Chebyshev UCL	12.75
97.5% KM Chebyshev UCL	17.33	99% KM Chebyshev UCL	26.32

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.277	k star (bias corrected MLE)	N/A
Theta hat (MLE)	20.8	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.663	nu star (bias corrected)	N/A
Mean (detects)	5.767		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.169
Maximum	17	Median	0.01
SD	5.993	CV	2.763
k hat (MLE)	0.188	k star (bias corrected MLE)	0.201
Theta hat (MLE)	11.51	Theta star (bias corrected MLE)	10.78
nu hat (MLE)	3.016	nu star (bias corrected)	3.218
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.22, α)	0.44	Adjusted Chi Square Value (3.22, β)	0.255
95% Gamma Approximate UCL (use when n>=50)	15.87	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.176	SD (KM)	5.604
Variance (KM)	31.4	SE of Mean (KM)	2.426
k hat (KM)	0.151	k star (KM)	0.178
nu hat (KM)	2.412	nu star (KM)	2.841
theta hat (KM)	14.43	theta star (KM)	12.25
80% gamma percentile (KM)	2.676	90% gamma percentile (KM)	6.557
95% gamma percentile (KM)	11.55	99% gamma percentile (KM)	25.57

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.84, α)	0.327	Adjusted Chi Square Value (2.84, β)	0.188
95% Gamma Approximate KM-UCL (use when n>=50)	18.91	95% Gamma Adjusted KM-UCL (use when n<50)	32.94

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.983	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	2.164	Mean in Log Scale	-4.876
SD in Original Scale	5.996	SD in Log Scale	4.08
95% t UCL (assumes normality of ROS data)	6.18	95% Percentile Bootstrap UCL	6.379
95% BCA Bootstrap UCL	8.501	95% Bootstrap t UCL	1799
95% H-UCL (Log ROS)	4.318E+9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.702	KM Geo Mean	0.067
KM SD (logged)	2.258	95% Critical H Value (KM-Log)	6.867
KM Standard Error of Mean (logged)	0.978	95% H-UCL (KM -Log)	300.4
KM SD (logged)	2.258	95% Critical H Value (KM-Log)	6.867
KM Standard Error of Mean (logged)	0.978		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.198	Mean in Log Scale	-2.358
SD in Original Scale	5.982	SD in Log Scale	2.377
95% t UCL (Assumes normality)	6.204	95% H-Stat UCL	1034

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 6.773

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

gamma-Chlordane (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.047	Minimum Non-Detect	0.021
Maximum Detect	0.38	Maximum Non-Detect	0.21
Variance Detects	0.0335	Percent Non-Detects	62.5%
Mean Detects	0.17	SD Detects	0.183
Median Detects	0.082	CV Detects	1.079
Skewness Detects	1.661	Kurtosis Detects	N/A
Mean of Logged Detects	-2.175	SD of Logged Detects	1.082

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0849	KM Standard Error of Mean	0.0501
KM SD	0.114	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.18	95% KM (Percentile Bootstrap) UCL	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% KM (z) UCL	0.167	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.235	95% KM Chebyshev UCL	0.303
97.5% KM Chebyshev UCL	0.398	99% KM Chebyshev UCL	0.584

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.388	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.122	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8.331	nu star (bias corrected)	N/A
Mean (detects)	0.17		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0699
Maximum	0.38	Median	0.01
SD	0.128	CV	1.833
k hat (MLE)	0.598	k star (bias corrected MLE)	0.457
Theta hat (MLE)	0.117	Theta star (bias corrected MLE)	0.153
nu hat (MLE)	9.574	nu star (bias corrected)	7.317
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (7.32, α)	2.346	Adjusted Chi Square Value (7.32, β)	1.699
95% Gamma Approximate UCL (use when n>=50)	0.218	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0849	SD (KM)	0.114
Variance (KM)	0.013	SE of Mean (KM)	0.0501
k hat (KM)	0.555	k star (KM)	0.43
nu hat (KM)	8.881	nu star (KM)	6.884
theta hat (KM)	0.153	theta star (KM)	0.197
80% gamma percentile (KM)	0.138	90% gamma percentile (KM)	0.237
95% gamma percentile (KM)	0.344	99% gamma percentile (KM)	0.612

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.88, α)	2.107	Adjusted Chi Square Value (6.88, β)	1.504
95% Gamma Approximate KM-UCL (use when n>=50)	0.277	95% Gamma Adjusted KM-UCL (use when n<50)	0.389

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0755	Mean in Log Scale	-3.36
SD in Original Scale	0.125	SD in Log Scale	1.21
95% t UCL (assumes normality of ROS data)	0.159	95% Percentile Bootstrap UCL	0.157
95% BCA Bootstrap UCL	0.203	95% Bootstrap t UCL	0.599
95% H-UCL (Log ROS)	0.442		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.027	KM Geo Mean	0.0485
KM SD (logged)	0.947	95% Critical H Value (KM-Log)	3.296
KM Standard Error of Mean (logged)	0.457	95% H-UCL (KM -Log)	0.247
KM SD (logged)	0.947	95% Critical H Value (KM-Log)	3.296
KM Standard Error of Mean (logged)	0.457		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0988	Mean in Log Scale	-2.881
SD in Original Scale	0.119	SD in Log Scale	1.197
95% t UCL (Assumes normality)	0.179	95% H-Stat UCL	0.678

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 0.18

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.

gamma-Chlordane (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.016	Mean	10.03
Maximum	69	Median	1.255
SD	23.9	Std. Error of Mean	8.449
Coefficient of Variation	2.383	Skewness	2.797

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.482	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.468	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	26.03	95% Adjusted-CLT UCL (Chen-1995)	32.85
		95% Modified-t UCL (Johnson-1978)	27.43

Gamma GOF Test

A-D Test Statistic	0.511	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.813	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.26	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.319	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.259	k star (bias corrected MLE)	0.245
Theta hat (MLE)	38.65	Theta star (bias corrected MLE)	40.85
nu hat (MLE)	4.15	nu star (bias corrected)	3.927
MLE Mean (bias corrected)	10.03	MLE Sd (bias corrected)	20.24
		Approximate Chi Square Value (0.05)	0.693
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.422

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	56.81	95% Adjusted Gamma UCL (use when n<50)	93.25

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.168	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-4.135	Mean of logged Data	-0.417
Maximum of Logged Data	4.234	SD of logged Data	2.963

Assuming Lognormal Distribution

95% H-UCL	1134741	90% Chebyshev (MVUE) UCL	44.55
95% Chebyshev (MVUE) UCL	59.11	97.5% Chebyshev (MVUE) UCL	79.31
99% Chebyshev (MVUE) UCL	119		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	23.92	95% Jackknife UCL	26.03
95% Standard Bootstrap UCL	22.91	95% Bootstrap-t UCL	160.1
95% Hall's Bootstrap UCL	128.2	95% Percentile Bootstrap UCL	26.64
95% BCA Bootstrap UCL	35.06		
90% Chebyshev(Mean, Sd) UCL	35.37	95% Chebyshev(Mean, Sd) UCL	46.85
97.5% Chebyshev(Mean, Sd) UCL	62.79	99% Chebyshev(Mean, Sd) UCL	94.09

Suggested UCL to Use

95% Adjusted Gamma UCL 93.25

Recommended UCL exceeds the maximum observation

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.

Heptachlor (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-01) was not processed!

Heptachlor (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	7
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-02) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Heptachlor (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-03) was not processed!

Heptachlor (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 Heptachlor (sts-04) was not processed!

Heptachlor (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-05) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Heptachlor (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 Heptachlor (sts-06) was not processed!

Heptachlor (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.012	Minimum Non-Detect	0.021
Maximum Detect	21	Maximum Non-Detect	0.23
Variance Detects	220.2	Percent Non-Detects	75%
Mean Detects	10.51	SD Detects	14.84
Median Detects	10.51	CV Detects	1.413
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.689	SD of Logged Detects	5.28

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	2.636	KM Standard Error of Mean	3.471
KM SD	6.941	95% KM (BCA) UCL	N/A
95% KM (t) UCL	9.211	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	8.344	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	13.05	95% KM Chebyshev UCL	17.76

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

97.5% KM Chebyshev UCL	24.31	99% KM Chebyshev UCL	37.17

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.236	k star (bias corrected MLE)	N/A
Theta hat (MLE)	44.56	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	0.943	nu star (bias corrected)	N/A
Mean (detects)	10.51		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.636	SD (KM)	6.941
Variance (KM)	48.18	SE of Mean (KM)	3.471
k hat (KM)	0.144	k star (KM)	0.173
nu hat (KM)	2.307	nu star (KM)	2.775
theta hat (KM)	18.28	theta star (KM)	15.2
80% gamma percentile (KM)	3.193	90% gamma percentile (KM)	7.931
95% gamma percentile (KM)	14.06	99% gamma percentile (KM)	31.37

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (2.78, α)	0.309	Adjusted Chi Square Value (2.78, β)	0.178
95% Gamma Approximate KM-UCL (use when n>=50)	23.67	95% Gamma Adjusted KM-UCL (use when n<50)	41.18

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	2.64	Mean in Log Scale	-3.502
SD in Original Scale	7.418	SD in Log Scale	2.793
95% t UCL (assumes normality of ROS data)	7.609	95% Percentile Bootstrap UCL	7.883
95% BCA Bootstrap UCL	7.901	95% Bootstrap t UCL	5595
95% H-UCL (Log ROS)	10634		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.489	KM Geo Mean	0.0305
KM SD (logged)	2.47	95% Critical H Value (KM-Log)	7.475
KM Standard Error of Mean (logged)	1.235	95% H-UCL (KM -Log)	690.7
KM SD (logged)	2.47	95% Critical H Value (KM-Log)	7.475
KM Standard Error of Mean (logged)	1.235		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.668	Mean in Log Scale	-2.605
SD in Original Scale	7.407	SD in Log Scale	2.461
95% t UCL (Assumes normality)	7.63	95% H-Stat UCL	1566

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Data do not follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

99% KM (Chebyshev) UCL 37.17

Warning: Recommended UCL exceeds the maximum observation

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.

Heptachlor (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-08) was not processed!

Heptachlor (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.13	Minimum Non-Detect	0.002
Maximum Detect	41	Maximum Non-Detect	2.2
Variance Detects	522.8	Percent Non-Detects	62.5%
Mean Detects	14.64	SD Detects	22.86
Median Detects	2.8	CV Detects	1.561
Skewness Detects	1.706	Kurtosis Detects	N/A
Mean of Logged Detects	0.901	SD of Logged Detects	2.879

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.799	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.364	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	5.501	KM Standard Error of Mean	5.823
KM SD	13.45	95% KM (BCA) UCL	N/A
95% KM (t) UCL	16.53	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	15.08	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	22.97	95% KM Chebyshev UCL	30.88
97.5% KM Chebyshev UCL	41.87	99% KM Chebyshev UCL	63.44

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.373	k star (bias corrected MLE)	N/A
Theta hat (MLE)	39.23	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.239	nu star (bias corrected)	N/A
Mean (detects)	14.64		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.498
Maximum	41	Median	0.01
SD	14.38	CV	2.615
k hat (MLE)	0.177	k star (bias corrected MLE)	0.194
Theta hat (MLE)	31.11	Theta star (bias corrected MLE)	28.37
nu hat (MLE)	2.827	nu star (bias corrected)	3.1
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.10, α)	0.403	Adjusted Chi Square Value (3.10, β)	0.232
95% Gamma Approximate UCL (use when n>=50)	42.32	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.501	SD (KM)	13.45
Variance (KM)	180.9	SE of Mean (KM)	5.823
k hat (KM)	0.167	k star (KM)	0.188
nu hat (KM)	2.677	nu star (KM)	3.006
theta hat (KM)	32.88	theta star (KM)	29.27
80% gamma percentile (KM)	7.002	90% gamma percentile (KM)	16.62
95% gamma percentile (KM)	28.8	99% gamma percentile (KM)	62.68

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.01, α)	0.374	Adjusted Chi Square Value (3.01, β)	0.215
95% Gamma Approximate KM-UCL (use when n>=50)	44.18	95% Gamma Adjusted KM-UCL (use when n<50)	76.85

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.998	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	5.492	Mean in Log Scale	-4.183
SD in Original Scale	14.38	SD in Log Scale	4.526
95% t UCL (assumes normality of ROS data)	15.12	95% Percentile Bootstrap UCL	15.39
95% BCA Bootstrap UCL	16.11	95% Bootstrap t UCL	1726
95% H-UCL (Log ROS)	4.273E+12		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.285	KM Geo Mean	0.0374
KM SD (logged)	3.683	95% Critical H Value (KM-Log)	10.99
KM Standard Error of Mean (logged)	1.665	95% H-UCL (KM -Log)	1.470E+8
KM SD (logged)	3.683	95% Critical H Value (KM-Log)	10.99
KM Standard Error of Mean (logged)	1.665		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.644	Mean in Log Scale	-2.42
SD in Original Scale	14.32	SD in Log Scale	3.977
95% t UCL (Assumes normality)	15.24	95% H-Stat UCL	1.324E+10

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% KM (t) UCL 16.53

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.

Methoxychlor (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-01) was not processed!

Methoxychlor (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	7
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-02) was not processed!

Methoxychlor (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

The data set for variable Methoxychlor (sts-03) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Methoxychlor (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-04) was not processed!

Methoxychlor (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-05) was not processed!

Methoxychlor (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-06) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Methoxychlor (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-07) was not processed!

Methoxychlor (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-08) was not processed!

Methoxychlor (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-09) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Toxaphene (sts-01)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	17	Minimum Non-Detect	1.9
Maximum Detect	21	Maximum Non-Detect	12
Variance Detects	8	Percent Non-Detects	75%
Mean Detects	19	SD Detects	2.828
Median Detects	19	CV Detects	0.149
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	2.939	SD of Logged Detects	0.149

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	6.175	KM Standard Error of Mean	3.736
KM SD	7.472	95% KM (BCA) UCL	N/A
95% KM (t) UCL	13.25	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	12.32	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	17.38	95% KM Chebyshev UCL	22.46
97.5% KM Chebyshev UCL	29.51	99% KM Chebyshev UCL	43.35

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	89.92	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.211	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	359.7	nu star (bias corrected)	N/A
Mean (detects)	19		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	6.175	SD (KM)	7.472
Variance (KM)	55.83	SE of Mean (KM)	3.736
k hat (KM)	0.683	k star (KM)	0.51
nu hat (KM)	10.93	nu star (KM)	8.163
theta hat (KM)	9.041	theta star (KM)	12.1
80% gamma percentile (KM)	10.15	90% gamma percentile (KM)	16.64
95% gamma percentile (KM)	23.55	99% gamma percentile (KM)	40.52

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (8.16, α)	2.83	Adjusted Chi Square Value (8.16, β)	2.099
95% Gamma Approximate KM-UCL (use when n>=50)	17.81	95% Gamma Adjusted KM-UCL (use when n<50)	24.02

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	11.39	Mean in Log Scale	2.367
SD in Original Scale	4.883	SD in Log Scale	0.369
95% t UCL (assumes normality of ROS data)	14.66	95% Percentile Bootstrap UCL	14.11
95% BCA Bootstrap UCL	15.13	95% Bootstrap t UCL	26.07
95% H-UCL (Log ROS)	15.41		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.216	KM Geo Mean	3.374
KM SD (logged)	0.996	95% Critical H Value (KM-Log)	3.416
KM Standard Error of Mean (logged)	0.498	95% H-UCL (KM -Log)	20.05
KM SD (logged)	0.996	95% Critical H Value (KM-Log)	3.416
KM Standard Error of Mean (logged)	0.498		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.425	Mean in Log Scale	1.497
SD in Original Scale	7.494	SD in Log Scale	1.142
95% t UCL (Assumes normality)	12.44	95% H-Stat UCL	43.92

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL	13.25	KM H-UCL	20.05
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.

Toxaphene (sts-02)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	8.4	Minimum Non-Detect	2.5
Maximum Detect	8.7	Maximum Non-Detect	13
Variance Detects	0.045	Percent Non-Detects	71.43%
Mean Detects	8.55	SD Detects	0.212
Median Detects	8.55	CV Detects	0.0248
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	2.146	SD of Logged Detects	0.0248

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	5.525	KM Standard Error of Mean	2.14
KM SD	3.027	95% KM (BCA) UCL	N/A
95% KM (t) UCL	9.684	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	9.046	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	11.95	95% KM Chebyshev UCL	14.85
97.5% KM Chebyshev UCL	18.89	99% KM Chebyshev UCL	26.82

Gamma GOF Tests on Detected Observations Only

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3249	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00263	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	12995	nu star (bias corrected)	N/A
Mean (detects)	8.55		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.525	SD (KM)	3.027
Variance (KM)	9.162	SE of Mean (KM)	2.14
k hat (KM)	3.332	k star (KM)	1.999
nu hat (KM)	46.65	nu star (KM)	27.99
theta hat (KM)	1.658	theta star (KM)	2.764
80% gamma percentile (KM)	8.272	90% gamma percentile (KM)	10.75
95% gamma percentile (KM)	13.11	99% gamma percentile (KM)	18.34

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (27.99, α)	16.92	Adjusted Chi Square Value (27.99, β)	14.38
95% Gamma Approximate KM-UCL (use when n>=50)	9.14	95% Gamma Adjusted KM-UCL (use when n<50)	10.75

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	8.176	Mean in Log Scale	2.101
SD in Original Scale	0.34	SD in Log Scale	0.0414
95% t UCL (assumes normality of ROS data)	8.426	95% Percentile Bootstrap UCL	8.376
95% BCA Bootstrap UCL	8.369	95% Bootstrap t UCL	8.47
95% H-UCL (Log ROS)	N/A		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.531	KM Geo Mean	4.623
KM SD (logged)	0.615	95% Critical H Value (KM-Log)	2.706
KM Standard Error of Mean (logged)	0.435	95% H-UCL (KM -Log)	11.02
KM SD (logged)	0.615	95% Critical H Value (KM-Log)	2.706
KM Standard Error of Mean (logged)	0.435		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.614	Mean in Log Scale	1.552
SD in Original Scale	2.811	SD in Log Scale	0.721
95% t UCL (Assumes normality)	7.679	95% H-Stat UCL	14.61

DL/2 is not a recommended method, provided for comparisons and historical reasons

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	9.684	KM H-UCL	11.02
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Warning: Recommended UCL exceeds the maximum observation

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.

Toxaphene (sts-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	4.5	Minimum Non-Detect	1.2
Maximum Detect	8.9	Maximum Non-Detect	43
Variance Detects	9.68	Percent Non-Detects	75%
Mean Detects	6.7	SD Detects	3.111
Median Detects	6.7	CV Detects	0.464
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	1.845	SD of Logged Detects	0.482

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	3.4	KM Standard Error of Mean	1.918
KM SD	3.032	95% KM (BCA) UCL	N/A
95% KM (t) UCL	7.034	95% KM (Percentile Bootstrap) UCL	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

95% KM (z) UCL	6.555	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	9.154	95% KM Chebyshev UCL	11.76
97.5% KM Chebyshev UCL	15.38	99% KM Chebyshev UCL	22.48

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	8.929	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.75	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	35.71	nu star (bias corrected)	N/A
Mean (detects)	6.7		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.4	SD (KM)	3.032
Variance (KM)	9.196	SE of Mean (KM)	1.918
k hat (KM)	1.257	k star (KM)	0.869
nu hat (KM)	20.11	nu star (KM)	13.9
theta hat (KM)	2.705	theta star (KM)	3.913
80% gamma percentile (KM)	5.529	90% gamma percentile (KM)	8.103
95% gamma percentile (KM)	10.71	99% gamma percentile (KM)	16.82

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (13.90, α)	6.506	Adjusted Chi Square Value (13.90, β)	5.281
95% Gamma Approximate KM-UCL (use when n>=50)	7.267	95% Gamma Adjusted KM-UCL (use when n<50)	8.952

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	2.809	Mean in Log Scale	0.661
SD in Original Scale	2.809	SD in Log Scale	0.886
95% t UCL (assumes normality of ROS data)	4.691	95% Percentile Bootstrap UCL	4.374
95% BCA Bootstrap UCL	4.818	95% Bootstrap t UCL	6.942
95% H-UCL (Log ROS)	8.249		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.847	KM Geo Mean	2.334
KM SD (logged)	0.843	95% Critical H Value (KM-Log)	3.049
KM Standard Error of Mean (logged)	0.533	95% H-UCL (KM -Log)	8.789
KM SD (logged)	0.843	95% Critical H Value (KM-Log)	3.049
KM Standard Error of Mean (logged)	0.533		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	6.225	Mean in Log Scale	1.315
SD in Original Scale	6.748	SD in Log Scale	1.157
95% t UCL (Assumes normality)	10.74	95% H-Stat UCL	38.62

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL	7.034	KM H-UCL	8.789
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.

Toxaphene (sts-04)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	2.2	Minimum Non-Detect	2.2
Maximum Detect	4.8	Maximum Non-Detect	21
Variance Detects	1.903	Percent Non-Detects	62.5%
Mean Detects	3.767	SD Detects	1.38
Median Detects	4.3	CV Detects	0.366
Skewness Detects	-1.48	Kurtosis Detects	N/A
Mean of Logged Detects	1.272	SD of Logged Detects	0.422

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.317	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.931	KM Standard Error of Mean	0.529
KM SD	1.089	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.934	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.802	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	4.519	95% KM Chebyshev UCL	5.239
97.5% KM Chebyshev UCL	6.237	99% KM Chebyshev UCL	8.198

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	9.373	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.402	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	56.24	nu star (bias corrected)	N/A
Mean (detects)	3.767		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1.175	Mean	2.614
Maximum	4.8	Median	2.201
SD	1.261	CV	0.482
k hat (MLE)	5.486	k star (bias corrected MLE)	3.512
Theta hat (MLE)	0.477	Theta star (bias corrected MLE)	0.744
nu hat (MLE)	87.78	nu star (bias corrected)	56.2
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (56.20, α)	39.97	Adjusted Chi Square Value (56.20, β)	36.53
95% Gamma Approximate UCL (use when n>=50)	3.676	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.931	SD (KM)	1.089
Variance (KM)	1.187	SE of Mean (KM)	0.529
k hat (KM)	7.241	k star (KM)	4.609
nu hat (KM)	115.9	nu star (KM)	73.74
theta hat (KM)	0.405	theta star (KM)	0.636
80% gamma percentile (KM)	3.977	90% gamma percentile (KM)	4.76
95% gamma percentile (KM)	5.477	99% gamma percentile (KM)	6.998

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (73.74, α)	54.97	Adjusted Chi Square Value (73.74, β)	50.89
95% Gamma Approximate KM-UCL (use when n>=50)	3.933	95% Gamma Adjusted KM-UCL (use when n<50)	4.248

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.337	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	2.631	Mean in Log Scale	0.885
SD in Original Scale	1.225	SD in Log Scale	0.418
95% t UCL (assumes normality of ROS data)	3.452	95% Percentile Bootstrap UCL	3.317
95% BCA Bootstrap UCL	3.416	95% Bootstrap t UCL	5.147
95% H-UCL (Log ROS)	3.759		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.015	KM Geo Mean	2.759
KM SD (logged)	0.336	95% Critical H Value (KM-Log)	2.104
KM Standard Error of Mean (logged)	0.164	95% H-UCL (KM -Log)	3.812
KM SD (logged)	0.336	95% Critical H Value (KM-Log)	2.104
KM Standard Error of Mean (logged)	0.164		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.569	Mean in Log Scale	1.003
SD in Original Scale	3.103	SD in Log Scale	0.76
95% t UCL (Assumes normality)	5.647	95% H-Stat UCL	8.274

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	3.934

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Toxaphene (sts-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-05) was not processed!

Toxaphene (sts-06)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-06) was not processed!

Toxaphene (sts-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 Toxaphene (sts-07) was not processed!

Toxaphene (sts-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 Toxaphene (sts-08) was not processed!

Toxaphene (sts-09)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.25	Minimum Non-Detect	20
Maximum Detect	0.74	Maximum Non-Detect	2100
Variance Detects	0.12	Percent Non-Detects	75%
Mean Detects	0.495	SD Detects	0.346
Median Detects	0.495	CV Detects	0.7
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.844	SD of Logged Detects	0.767

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.495	KM Standard Error of Mean	0.245
KM SD	0.245	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.959	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.898	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.23	95% KM Chebyshev UCL	1.563
97.5% KM Chebyshev UCL	2.025	99% KM Chebyshev UCL	2.933

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	3.717	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.133	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	14.87	nu star (bias corrected)	N/A
Mean (detects)	0.495		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.495	SD (KM)	0.245
Variance (KM)	0.06	SE of Mean (KM)	0.245
k hat (KM)	4.082	k star (KM)	2.635
nu hat (KM)	65.31	nu star (KM)	42.15
theta hat (KM)	0.121	theta star (KM)	0.188
80% gamma percentile (KM)	0.717	90% gamma percentile (KM)	0.904
95% gamma percentile (KM)	1.079	99% gamma percentile (KM)	1.462

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (42.15, α)	28.27	Adjusted Chi Square Value (42.15, β)	25.43
95% Gamma Approximate KM-UCL (use when n>=50)	0.738	95% Gamma Adjusted KM-UCL (use when n<50)	0.821

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	0.446	Mean in Log Scale	-0.844
SD in Original Scale	0.134	SD in Log Scale	0.29
95% t UCL (assumes normality of ROS data)	0.536	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.561		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.844	KM Geo Mean	0.43
KM SD (logged)	0.543	95% Critical H Value (KM-Log)	2.428
KM Standard Error of Mean (logged)	0.543	95% H-UCL (KM -Log)	0.82
KM SD (logged)	0.543	95% Critical H Value (KM-Log)	2.428
KM Standard Error of Mean (logged)	0.543		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	198.9	Mean in Log Scale	3.321
SD in Original Scale	353.7	SD in Log Scale	2.899
95% t UCL (Assumes normality)	435.8	95% H-Stat UCL	25807373

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Data do not follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (Chebyshev) UCL 1.563

Warning: Recommended UCL exceeds the maximum observation

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 Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/4/2018 12:18:33 PM
From File	2018_05_21 Eco SO (2018) ProUCL input (StS-10 to -18) - BFEL ATL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDD (sts-10) was not processed!

4,4'-DDD (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.051	Minimum Non-Detect	0.009
Maximum Detect	1.1	Maximum Non-Detect	0.049
Variance Detects	0.241	Percent Non-Detects	50%
Mean Detects	0.437	SD Detects	0.491
Median Detects	0.299	CV Detects	1.124
Skewness Detects	1.055	Kurtosis Detects	-0.241
Mean of Logged Detects	-1.521	SD of Logged Detects	1.477

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.223	KM Standard Error of Mean	0.151
KM SD	0.369	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.509	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.471	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.675	95% KM Chebyshev UCL	0.88
97.5% KM Chebyshev UCL	1.165	99% KM Chebyshev UCL	1.723

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.36	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.669	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.301	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.404	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)	0.848	k star (bias corrected MLE)	0.379
Theta hat (MLE)	0.515	Theta star (bias corrected MLE)	1.154
nu hat (MLE)	6.788	nu star (bias corrected)	3.03
Mean (detects)	0.437		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.224
Maximum	1.1	Median	0.0305
SD	0.395	CV	1.764
k hat (MLE)	0.417	k star (bias corrected MLE)	0.344
Theta hat (MLE)	0.536	Theta star (bias corrected MLE)	0.65
nu hat (MLE)	6.679	nu star (bias corrected)	5.508
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.51, α)	1.394	Adjusted Chi Square Value (5.51, β)	0.939
95% Gamma Approximate UCL (use when n>=50)	0.884	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (KM)	0.223	SD (KM)	0.369
Variance (KM)	0.136	SE of Mean (KM)	0.151
k hat (KM)	0.365	k star (KM)	0.311
nu hat (KM)	5.84	nu star (KM)	4.983
theta hat (KM)	0.611	theta star (KM)	0.716
80% gamma percentile (KM)	0.345	90% gamma percentile (KM)	0.655
95% gamma percentile (KM)	1.008	99% gamma percentile (KM)	1.923

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.98, α)	1.145	Adjusted Chi Square Value (4.98, β)	0.749
95% Gamma Approximate KM-UCL (use when n>=50)	0.972	95% Gamma Adjusted KM-UCL (use when n<50)	1.484

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.257	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.22	Mean in Log Scale	-3.783
SD in Original Scale	0.397	SD in Log Scale	2.604
95% t UCL (assumes normality of ROS data)	0.486	95% Percentile Bootstrap UCL	0.43
95% BCA Bootstrap UCL	0.567	95% Bootstrap t UCL	2.73
95% H-UCL (Log ROS)	1543		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.116	KM Geo Mean	0.0443
KM SD (logged)	1.833	95% Critical H Value (KM-Log)	5.664
KM Standard Error of Mean (logged)	0.748	95% H-UCL (KM -Log)	12.05
KM SD (logged)	1.833	95% Critical H Value (KM-Log)	5.664
KM Standard Error of Mean (logged)	0.748		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.227	Mean in Log Scale	-2.901
SD in Original Scale	0.393	SD in Log Scale	1.836
95% t UCL (Assumes normality)	0.49	95% H-Stat UCL	15.24

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	0.509

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDD (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.095	Minimum Non-Detect	0.0048
Maximum Detect	0.88	Maximum Non-Detect	0.046
Variance Detects	0.308	Percent Non-Detects	75%
Mean Detects	0.488	SD Detects	0.555
Median Detects	0.488	CV Detects	1.139
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.241	SD of Logged Detects	1.574

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.125	KM Standard Error of Mean	0.143
KM SD	0.287	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.397	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.361	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.556	95% KM Chebyshev UCL	0.75
97.5% KM Chebyshev UCL	1.021	99% KM Chebyshev UCL	1.552

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.094	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.446	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.375	nu star (bias corrected)	N/A
Mean (detects)	0.488		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.125	SD (KM)	0.287

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Variance (KM)	0.0822	SE of Mean (KM)	0.143
k hat (KM)	0.192	k star (KM)	0.203
nu hat (KM)	3.064	nu star (KM)	3.249
theta hat (KM)	0.655	theta star (KM)	0.618
80% gamma percentile (KM)	0.167	90% gamma percentile (KM)	0.38
95% gamma percentile (KM)	0.644	99% gamma percentile (KM)	1.37

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (3.25, α)	0.45	Adjusted Chi Square Value (3.25, β)	0.261
95% Gamma Approximate KM-UCL (use when n>=50)	0.906	95% Gamma Adjusted KM-UCL (use when n<50)	1.56

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	0.122	Mean in Log Scale	-7.267
SD in Original Scale	0.308	SD in Log Scale	3.889
95% t UCL (assumes normality of ROS data)	0.328	95% Percentile Bootstrap UCL	0.33
95% BCA Bootstrap UCL	0.44	95% Bootstrap t UCL	225
95% H-UCL (Log ROS)	33842197		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.315	KM Geo Mean	0.0134
KM SD (logged)	1.86	95% Critical H Value (KM-Log)	5.739
KM Standard Error of Mean (logged)	0.93	95% H-UCL (KM -Log)	4.26
KM SD (logged)	1.86	95% Critical H Value (KM-Log)	5.739
KM Standard Error of Mean (logged)	0.93		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.132	Mean in Log Scale	-3.822
SD in Original Scale	0.304	SD in Log Scale	1.904
95% t UCL (Assumes normality)	0.335	95% H-Stat UCL	9.112

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

975% KM (Chebyshev) UCL 1.021

Warning: Recommended UCL exceeds the maximum observation

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDD (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.73	Minimum Non-Detect	0.044
Maximum Detect	22	Maximum Non-Detect	0.49
Variance Detects	149.3	Percent Non-Detects	62.5%
Mean Detects	7.89	SD Detects	12.22
Median Detects	0.94	CV Detects	1.549
Skewness Detects	1.731	Kurtosis Detects	N/A
Mean of Logged Detects	0.905	SD of Logged Detects	1.898

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.757	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.382	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	2.986	KM Standard Error of Mean	3.115
KM SD	7.194	95% KM (BCA) UCL	N/A
95% KM (t) UCL	8.888	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	8.11	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	12.33	95% KM Chebyshev UCL	16.57
97.5% KM Chebyshev UCL	22.44	99% KM Chebyshev UCL	33.98

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.541	k star (bias corrected MLE)	N/A
Theta hat (MLE)	14.59	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.244	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	7.89

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.965
Maximum	22	Median	0.01
SD	7.701	CV	2.597
k hat (MLE)	0.203	k star (bias corrected MLE)	0.21
Theta hat (MLE)	14.64	Theta star (bias corrected MLE)	14.12
nu hat (MLE)	3.241	nu star (bias corrected)	3.359
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.36, α)	0.486	Adjusted Chi Square Value (3.36, β)	0.284
95% Gamma Approximate UCL (use when n>=50)	20.48	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.986	SD (KM)	7.194
Variance (KM)	51.76	SE of Mean (KM)	3.115
k hat (KM)	0.172	k star (KM)	0.191
nu hat (KM)	2.757	nu star (KM)	3.056
theta hat (KM)	17.33	theta star (KM)	15.63
80% gamma percentile (KM)	3.838	90% gamma percentile (KM)	9.026
95% gamma percentile (KM)	15.57	99% gamma percentile (KM)	33.72

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.06, α)	0.389	Adjusted Chi Square Value (3.06, β)	0.224
95% Gamma Approximate KM-UCL (use when n>=50)	23.45	95% Gamma Adjusted KM-UCL (use when n<50)	40.72

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.805	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.361	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	2.961	Mean in Log Scale	-3.331
SD in Original Scale	7.702	SD in Log Scale	3.651
95% t UCL (assumes normality of ROS data)	8.12	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	95599374		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.613	KM Geo Mean	0.199
KM SD (logged)	2.169	95% Critical H Value (KM-Log)	6.614
KM Standard Error of Mean (logged)	0.939	95% H-UCL (KM -Log)	473.6
KM SD (logged)	2.169	95% Critical H Value (KM-Log)	6.614
KM Standard Error of Mean (logged)	0.939		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.039	Mean in Log Scale	-1.239
SD in Original Scale	7.669	SD in Log Scale	2.238
95% t UCL (Assumes normality)	8.176	95% H-Stat UCL	1124

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 8.888

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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'-DDD (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDD (sts-14) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDD (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDD (sts-15) was not processed!

4,4'-DDD (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.057	Minimum Non-Detect	0.042
Maximum Detect	0.77	Maximum Non-Detect	0.51
Variance Detects	0.254	Percent Non-Detects	75%
Mean Detects	0.414	SD Detects	0.504
Median Detects	0.414	CV Detects	1.219
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.563	SD of Logged Detects	1.841

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

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

KM Mean	0.135	KM Standard Error of Mean	0.12
KM SD	0.24	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.363	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.333	95% KM Bootstrap t UCL	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

90% KM Chebyshev UCL	0.495	95% KM Chebyshev UCL	0.658
97.5% KM Chebyshev UCL	0.885	99% KM Chebyshev UCL	1.329

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.864	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.478	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.457	nu star (bias corrected)	N/A
Mean (detects)	0.414		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.135	SD (KM)	0.24
Variance (KM)	0.0576	SE of Mean (KM)	0.12
k hat (KM)	0.317	k star (KM)	0.282
nu hat (KM)	5.077	nu star (KM)	4.506
theta hat (KM)	0.426	theta star (KM)	0.48
80% gamma percentile (KM)	0.204	90% gamma percentile (KM)	0.402
95% gamma percentile (KM)	0.631	99% gamma percentile (KM)	1.232

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (4.51, α)	0.931	Adjusted Chi Square Value (4.51, β)	0.591
95% Gamma Approximate KM-UCL (use when n>=50)	0.654	95% Gamma Adjusted KM-UCL (use when n<50)	1.03

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	0.104	Mean in Log Scale	-5.875
SD in Original Scale	0.27	SD in Log Scale	2.844
95% t UCL (assumes normality of ROS data)	0.285	95% Percentile Bootstrap UCL	0.289
95% BCA Bootstrap UCL	0.304	95% Bootstrap t UCL	46.38
95% H-UCL (Log ROS)	1573		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.762	KM Geo Mean	0.0632
KM SD (logged)	0.951	95% Critical H Value (KM-Log)	3.306
KM Standard Error of Mean (logged)	0.476	95% H-UCL (KM -Log)	0.326
KM SD (logged)	0.951	95% Critical H Value (KM-Log)	3.306
KM Standard Error of Mean (logged)	0.476		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.149	Mean in Log Scale	-2.937
SD in Original Scale	0.263	SD in Log Scale	1.382
95% t UCL (Assumes normality)	0.326	95% H-Stat UCL	1.386

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Data do not follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

975% KM (Chebyshev) UCL 0.885

Warning: Recommended UCL exceeds the maximum observation

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'-DDD (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 4,4'-DDD (sts-17) was not processed!

4,4'-DDD (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	2	Number of Non-Detects	7
Number of Distinct Detects	2	Number of Distinct Non-Detects	7
Minimum Detect	0.27	Minimum Non-Detect	0.0041
Maximum Detect	10	Maximum Non-Detect	4.5
Variance Detects	47.34	Percent Non-Detects	77.78%
Mean Detects	5.135	SD Detects	6.88
Median Detects	5.135	CV Detects	1.34
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.497	SD of Logged Detects	2.554

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.154	KM Standard Error of Mean	1.475
KM SD	3.129	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.897	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.581	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	5.58	95% KM Chebyshev UCL	7.584
97.5% KM Chebyshev UCL	10.37	99% KM Chebyshev UCL	15.83

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.549	k star (bias corrected MLE)	N/A
Theta hat (MLE)	9.346	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.198	nu star (bias corrected)	N/A
Mean (detects)	5.135		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.154	SD (KM)	3.129
Variance (KM)	9.79	SE of Mean (KM)	1.475
k hat (KM)	0.136	k star (KM)	0.165
nu hat (KM)	2.449	nu star (KM)	2.966
theta hat (KM)	8.482	theta star (KM)	7.004
80% gamma percentile (KM)	1.35	90% gamma percentile (KM)	3.459
95% gamma percentile (KM)	6.23	99% gamma percentile (KM)	14.12

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0231
Approximate Chi Square Value (2.97, α)	0.362	Adjusted Chi Square Value (2.97, β)	0.229
95% Gamma Approximate KM-UCL (use when n>=50)	9.445	95% Gamma Adjusted KM-UCL (use when n<50)	14.97

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	1.142	Mean in Log Scale	-5.629
SD in Original Scale	3.323	SD in Log Scale	3.613
95% t UCL (assumes normality of ROS data)	3.201	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	853002		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.01	KM Geo Mean	0.0181
KM SD (logged)	2.673	95% Critical H Value (KM-Log)	7.479
KM Standard Error of Mean (logged)	1.322	95% H-UCL (KM -Log)	758.5

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM SD (logged)	2.673	95% Critical H Value (KM-Log)	7.479
KM Standard Error of Mean (logged)	1.322		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.425	Mean in Log Scale	-2.764
SD in Original Scale	3.296	SD in Log Scale	3.112
95% t UCL (Assumes normality)	3.468	95% H-Stat UCL	108738

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

KM Bootstrap t UCL N/A

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'-DDE (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.49	Minimum Non-Detect	0.041
Maximum Detect	0.67	Maximum Non-Detect	0.22
Variance Detects	0.0102	Percent Non-Detects	62.5%
Mean Detects	0.607	SD Detects	0.101
Median Detects	0.66	CV Detects	0.167
Skewness Detects	-1.713	Kurtosis Detects	N/A
Mean of Logged Detects	-0.51	SD of Logged Detects	0.176

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.368	**Lilliefors GOF Test**	

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.253	KM Standard Error of Mean	0.121
KM SD	0.278	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.482	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.451	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.615	95% KM Chebyshev UCL	0.779
97.5% KM Chebyshev UCL	1.006	99% KM Chebyshev UCL	1.453

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	50.14	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0121	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	300.8	nu star (bias corrected)	N/A
Mean (detects)	0.607		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.304	Mean	0.417
Maximum	0.67	Median	0.304
SD	0.166	CV	0.398
k hat (MLE)	8.205	k star (bias corrected MLE)	5.212
Theta hat (MLE)	0.0508	Theta star (bias corrected MLE)	0.0801
nu hat (MLE)	131.3	nu star (bias corrected)	83.39
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (83.39, α)	63.34	Adjusted Chi Square Value (83.39, β)	58.94
95% Gamma Approximate UCL (use when n>=50)	0.549	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.253	SD (KM)	0.278
Variance (KM)	0.0776	SE of Mean (KM)	0.121
k hat (KM)	0.826	k star (KM)	0.6
nu hat (KM)	13.22	nu star (KM)	9.595
theta hat (KM)	0.306	theta star (KM)	0.422
80% gamma percentile (KM)	0.417	90% gamma percentile (KM)	0.658
95% gamma percentile (KM)	0.911	99% gamma percentile (KM)	1.522

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.60, α)	3.69	Adjusted Chi Square Value (9.60, β)	2.825
95% Gamma Approximate KM-UCL (use when n>=50)	0.658	95% Gamma Adjusted KM-UCL (use when n<50)	0.86

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.786	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.37	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.441	Mean in Log Scale	-0.863
SD in Original Scale	0.148	SD in Log Scale	0.307
95% t UCL (assumes normality of ROS data)	0.54	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.562		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.188	KM Geo Mean	0.112
KM SD (logged)	1.303	95% Critical H Value (KM-Log)	4.207
KM Standard Error of Mean (logged)	0.564	95% H-UCL (KM -Log)	2.079
KM SD (logged)	1.303	95% Critical H Value (KM-Log)	4.207
KM Standard Error of Mean (logged)	0.564		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.258	Mean in Log Scale	-2.207
SD in Original Scale	0.295	SD in Log Scale	1.495
95% t UCL (Assumes normality)	0.455	95% H-Stat UCL	4.85

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 0.482

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'-DDE (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.07	Mean	0.752
Maximum	3	Median	0.29
SD	1.008	Std. Error of Mean	0.356
Coefficient of Variation	1.34	Skewness	1.917

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.742	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.254	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	1.428	95% Adjusted-CLT UCL (Chen-1995)	1.597
		95% Modified-t UCL (Johnson-1978)	1.468

Gamma GOF Test

A-D Test Statistic	0.454	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.234	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.305	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.722	k star (bias corrected MLE)	0.535
Theta hat (MLE)	1.041	Theta star (bias corrected MLE)	1.407
nu hat (MLE)	11.56	nu star (bias corrected)	8.556
MLE Mean (bias corrected)	0.752	MLE Sd (bias corrected)	1.029
		Approximate Chi Square Value (0.05)	3.061
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.292

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2.103	95% Adjusted Gamma UCL (use when n<50)	2.808

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.192	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.659	Mean of logged Data	-1.118
Maximum of Logged Data	1.099	SD of logged Data	1.426

Assuming Lognormal Distribution

95% H-UCL	10.44	90% Chebyshev (MVUE) UCL	1.872
95% Chebyshev (MVUE) UCL	2.384	97.5% Chebyshev (MVUE) UCL	3.096
99% Chebyshev (MVUE) UCL	4.493		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	1.339	95% Jackknife UCL	1.428
95% Standard Bootstrap UCL	1.308	95% Bootstrap-t UCL	2.213
95% Hall's Bootstrap UCL	3.345	95% Percentile Bootstrap UCL	1.327
95% BCA Bootstrap UCL	1.584		
90% Chebyshev(Mean, Sd) UCL	1.822	95% Chebyshev(Mean, Sd) UCL	2.306
97.5% Chebyshev(Mean, Sd) UCL	2.978	99% Chebyshev(Mean, Sd) UCL	4.299

Suggested UCL to Use

95% Student's-t UCL 1.428

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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'-DDE (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.058	Minimum Non-Detect	0.0048
Maximum Detect	1	Maximum Non-Detect	0.046
Variance Detects	0.235	Percent Non-Detects	62.5%
Mean Detects	0.463	SD Detects	0.485
Median Detects	0.33	CV Detects	1.048
Skewness Detects	1.139	Kurtosis Detects	N/A
Mean of Logged Detects	-1.319	SD of Logged Detects	1.435

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.177	KM Standard Error of Mean	0.142
KM SD	0.328	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.446	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.41	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.603	95% KM Chebyshev UCL	0.796
97.5% KM Chebyshev UCL	1.065	99% KM Chebyshev UCL	1.592

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.048	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.442	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.287	nu star (bias corrected)	N/A
Mean (detects)	0.463		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.18
Maximum	1	Median	0.01
SD	0.349	CV	1.943
k hat (MLE)	0.398	k star (bias corrected MLE)	0.332
Theta hat (MLE)	0.452	Theta star (bias corrected MLE)	0.542
nu hat (MLE)	6.362	nu star (bias corrected)	5.31
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.31, α)	1.298	Adjusted Chi Square Value (5.31, β)	0.865
95% Gamma Approximate UCL (use when n>=50)	0.735	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.177	SD (KM)	0.328
Variance (KM)	0.108	SE of Mean (KM)	0.142
k hat (KM)	0.289	k star (KM)	0.264
nu hat (KM)	4.62	nu star (KM)	4.221
theta hat (KM)	0.611	theta star (KM)	0.669
80% gamma percentile (KM)	0.261	90% gamma percentile (KM)	0.528
95% gamma percentile (KM)	0.841	99% gamma percentile (KM)	1.668

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.22, α)	0.811	Adjusted Chi Square Value (4.22, β)	0.505
95% Gamma Approximate KM-UCL (use when n>=50)	0.919	95% Gamma Adjusted KM-UCL (use when n<50)	1.476

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.984	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.225	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.174	Mean in Log Scale	-4.659
SD in Original Scale	0.352	SD in Log Scale	2.87
95% t UCL (assumes normality of ROS data)	0.41	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	6780		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.831	KM Geo Mean	0.0217
KM SD (logged)	2.074	95% Critical H Value (KM-Log)	6.346
KM Standard Error of Mean (logged)	0.898	95% H-UCL (KM -Log)	27
KM SD (logged)	2.074	95% Critical H Value (KM-Log)	6.346
KM Standard Error of Mean (logged)	0.898		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.181	Mean in Log Scale	-3.535
SD in Original Scale	0.349	SD in Log Scale	2.132
95% t UCL (Assumes normality)	0.414	95% H-Stat UCL	53.82

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.446

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'-DDE (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.069	Minimum Non-Detect	0.046
Maximum Detect	1.6	Maximum Non-Detect	4.5
Variance Detects	0.615	Percent Non-Detects	62.5%
Mean Detects	0.736	SD Detects	0.784
Median Detects	0.54	CV Detects	1.065
Skewness Detects	1.056	Kurtosis Detects	N/A
Mean of Logged Detects	-0.94	SD of Logged Detects	1.597

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.347	KM Standard Error of Mean	0.249
KM SD	0.538	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.819	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.757	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.094	95% KM Chebyshev UCL	1.433

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

97.5% KM Chebyshev UCL	1.903	99% KM Chebyshev UCL	2.826

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.92	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.801	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.519	nu star (bias corrected)	N/A
Mean (detects)	0.736		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.282
Maximum	1.6	Median	0.01
SD	0.563	CV	1.994
k hat (MLE)	0.343	k star (bias corrected MLE)	0.298
Theta hat (MLE)	0.823	Theta star (bias corrected MLE)	0.948
nu hat (MLE)	5.49	nu star (bias corrected)	4.764
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.76, α)	1.045	Adjusted Chi Square Value (4.76, β)	0.675
95% Gamma Approximate UCL (use when n>=50)	1.287	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.347	SD (KM)	0.538
Variance (KM)	0.29	SE of Mean (KM)	0.249
k hat (KM)	0.415	k star (KM)	0.343
nu hat (KM)	6.645	nu star (KM)	5.486
theta hat (KM)	0.835	theta star (KM)	1.011
80% gamma percentile (KM)	0.547	90% gamma percentile (KM)	1.005
95% gamma percentile (KM)	1.518	99% gamma percentile (KM)	2.833

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.49, α)	1.383	Adjusted Chi Square Value (5.49, β)	0.931
95% Gamma Approximate KM-UCL (use when n>=50)	1.375	95% Gamma Adjusted KM-UCL (use when n<50)	2.044

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.292	Mean in Log Scale	-2.816
SD in Original Scale	0.558	SD in Log Scale	1.885
95% t UCL (assumes normality of ROS data)	0.666	95% Percentile Bootstrap UCL	0.621
95% BCA Bootstrap UCL	0.808	95% Bootstrap t UCL	6.653
95% H-UCL (Log ROS)	22.27		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.075	KM Geo Mean	0.126
KM SD (logged)	1.31	95% Critical H Value (KM-Log)	4.228
KM Standard Error of Mean (logged)	0.614	95% H-UCL (KM -Log)	2.405
KM SD (logged)	1.31	95% Critical H Value (KM-Log)	4.228
KM Standard Error of Mean (logged)	0.614		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.635	Mean in Log Scale	-1.353
SD in Original Scale	0.83	SD in Log Scale	1.553
95% t UCL (Assumes normality)	1.191	95% H-Stat UCL	15.2

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 0.819

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDE (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.011	Minimum Non-Detect	0.021
Maximum Detect	0.68	Maximum Non-Detect	0.042
Variance Detects	0.144	Percent Non-Detects	40%
Mean Detects	0.242	SD Detects	0.379
Median Detects	0.036	CV Detects	1.565
Skewness Detects	1.724	Kurtosis Detects	N/A
Mean of Logged Detects	-2.74	SD of Logged Detects	2.123

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.778	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.151	KM Standard Error of Mean	0.145
KM SD	0.264	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.46	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.39	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.586	95% KM Chebyshev UCL	0.783
97.5% KM Chebyshev UCL	1.056	99% KM Chebyshev UCL	1.593

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.483	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.502	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.897	nu star (bias corrected)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.242

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.149
Maximum	0.68	Median	0.011
SD	0.297	CV	1.987
k hat (MLE)	0.413	k star (bias corrected MLE)	0.299
Theta hat (MLE)	0.362	Theta star (bias corrected MLE)	0.5
nu hat (MLE)	4.131	nu star (bias corrected)	2.986
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.99, α)	0.368	Adjusted Chi Square Value (2.99, β)	0.137
95% Gamma Approximate UCL (use when n>=50)	1.212	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.151	SD (KM)	0.264
Variance (KM)	0.0699	SE of Mean (KM)	0.145
k hat (KM)	0.328	k star (KM)	0.265
nu hat (KM)	3.28	nu star (KM)	2.645
theta hat (KM)	0.462	theta star (KM)	0.573
80% gamma percentile (KM)	0.224	90% gamma percentile (KM)	0.453
95% gamma percentile (KM)	0.721	99% gamma percentile (KM)	1.429

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.65, α)	0.276	Adjusted Chi Square Value (2.65, β)	0.105
95% Gamma Approximate KM-UCL (use when n>=50)	1.454	95% Gamma Adjusted KM-UCL (use when n<50)	3.822

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.275	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.15	Mean in Log Scale	-3.421
SD in Original Scale	0.296	SD in Log Scale	1.789
95% t UCL (assumes normality of ROS data)	0.433	95% Percentile Bootstrap UCL	0.413
95% BCA Bootstrap UCL	0.417	95% Bootstrap t UCL	9.579
95% H-UCL (Log ROS)	304.3		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.369	KM Geo Mean	0.0344
KM SD (logged)	1.573	95% Critical H Value (KM-Log)	7.449
KM Standard Error of Mean (logged)	0.876	95% H-UCL (KM -Log)	41.6
KM SD (logged)	1.573	95% Critical H Value (KM-Log)	7.449
KM Standard Error of Mean (logged)	0.876		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.152	Mean in Log Scale	-3.328
SD in Original Scale	0.296	SD in Log Scale	1.721
95% t UCL (Assumes normality)	0.433	95% H-Stat UCL	170.8

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	0.46

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'-DDE (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.06	Minimum Non-Detect	0.0043
Maximum Detect	0.52	Maximum Non-Detect	0.022
Variance Detects	0.0331	Percent Non-Detects	37.5%
Mean Detects	0.236	SD Detects	0.182
Median Detects	0.18	CV Detects	0.771
Skewness Detects	1.107	Kurtosis Detects	0.764
Mean of Logged Detects	-1.701	SD of Logged Detects	0.83

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.921	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.221	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.149	KM Standard Error of Mean	0.0675
KM SD	0.171	95% KM (BCA) UCL	0.257
95% KM (t) UCL	0.277	95% KM (Percentile Bootstrap) UCL	0.251
95% KM (z) UCL	0.26	95% KM Bootstrap t UCL	0.306
90% KM Chebyshev UCL	0.351	95% KM Chebyshev UCL	0.443
97.5% KM Chebyshev UCL	0.57	99% KM Chebyshev UCL	0.82

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.174	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.155	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.36	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)	2.094	k star (bias corrected MLE)	0.971
Theta hat (MLE)	0.113	Theta star (bias corrected MLE)	0.243
nu hat (MLE)	20.94	nu star (bias corrected)	9.71
Mean (detects)	0.236		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.151
Maximum	0.52	Median	0.09
SD	0.181	CV	1.193
k hat (MLE)	0.674	k star (bias corrected MLE)	0.505
Theta hat (MLE)	0.224	Theta star (bias corrected MLE)	0.3
nu hat (MLE)	10.78	nu star (bias corrected)	8.073
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (8.07, α)	2.778	Adjusted Chi Square Value (8.07, β)	2.055
95% Gamma Approximate UCL (use when n>=50)	0.44	95% Gamma Adjusted UCL (use when n<50)	0.594

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.149	SD (KM)	0.171
Variance (KM)	0.0291	SE of Mean (KM)	0.0675
k hat (KM)	0.763	k star (KM)	0.561
nu hat (KM)	12.22	nu star (KM)	8.968
theta hat (KM)	0.195	theta star (KM)	0.266
80% gamma percentile (KM)	0.246	90% gamma percentile (KM)	0.394
95% gamma percentile (KM)	0.55	99% gamma percentile (KM)	0.93

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.97, α)	3.308	Adjusted Chi Square Value (8.97, β)	2.5
95% Gamma Approximate KM-UCL (use when n>=50)	0.404	95% Gamma Adjusted KM-UCL (use when n<50)	0.535

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.995	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	0.154	Mean in Log Scale	-2.561
SD in Original Scale	0.178	SD in Log Scale	1.342
95% t UCL (assumes normality of ROS data)	0.273	95% Percentile Bootstrap UCL	0.267
95% BCA Bootstrap UCL	0.295	95% Bootstrap t UCL	0.395
95% H-UCL (Log ROS)	1.693		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.107	KM Geo Mean	0.0447
KM SD (logged)	1.907	95% Critical H Value (KM-Log)	5.872
KM Standard Error of Mean (logged)	0.754	95% H-UCL (KM -Log)	19
KM SD (logged)	1.907	95% Critical H Value (KM-Log)	5.872
KM Standard Error of Mean (logged)	0.754		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.149	Mean in Log Scale	-3.154
SD in Original Scale	0.182	SD in Log Scale	2.158
95% t UCL (Assumes normality)	0.271	95% H-Stat UCL	94.26

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.277

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'-DDE (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.064	Minimum Non-Detect	0.042
Maximum Detect	1.3	Maximum Non-Detect	0.045
Variance Detects	0.221	Percent Non-Detects	25%
Mean Detects	0.467	SD Detects	0.47
Median Detects	0.295	CV Detects	1.005
Skewness Detects	1.358	Kurtosis Detects	1.339
Mean of Logged Detects	-1.229	SD of Logged Detects	1.109

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.224	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	0.361	KM Standard Error of Mean	0.161
KM SD	0.415	95% KM (BCA) UCL	0.628
95% KM (t) UCL	0.665	95% KM (Percentile Bootstrap) UCL	0.637
95% KM (z) UCL	0.625	95% KM Bootstrap t UCL	1.131
90% KM Chebyshev UCL	0.843	95% KM Chebyshev UCL	1.061
97.5% KM Chebyshev UCL	1.364	99% KM Chebyshev UCL	1.959

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.215	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.712	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.205	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.339	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)	1.208	k star (bias corrected MLE)	0.715
Theta hat (MLE)	0.387	Theta star (bias corrected MLE)	0.654
nu hat (MLE)	14.49	nu star (bias corrected)	8.58
Mean (detects)	0.467		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.353
Maximum	1.3	Median	0.165
SD	0.45	CV	1.275
k hat (MLE)	0.599	k star (bias corrected MLE)	0.458
Theta hat (MLE)	0.589	Theta star (bias corrected MLE)	0.771
nu hat (MLE)	9.586	nu star (bias corrected)	7.325
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (7.32, α)	2.35	Adjusted Chi Square Value (7.32, β)	1.702
95% Gamma Approximate UCL (use when n>=50)	1.1	95% Gamma Adjusted UCL (use when n<50)	1.519

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.361	SD (KM)	0.415
Variance (KM)	0.172	SE of Mean (KM)	0.161
k hat (KM)	0.758	k star (KM)	0.557
nu hat (KM)	12.13	nu star (KM)	8.916
theta hat (KM)	0.476	theta star (KM)	0.648
80% gamma percentile (KM)	0.595	90% gamma percentile (KM)	0.954
95% gamma percentile (KM)	1.334	99% gamma percentile (KM)	2.258

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.92, α)	3.277	Adjusted Chi Square Value (8.92, β)	2.474
95% Gamma Approximate KM-UCL (use when n>=50)	0.982	95% Gamma Adjusted KM-UCL (use when n<50)	1.301

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.982	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.152	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	0.355	Mean in Log Scale	-1.939
SD in Original Scale	0.448	SD in Log Scale	1.615
95% t UCL (assumes normality of ROS data)	0.655	95% Percentile Bootstrap UCL	0.609
95% BCA Bootstrap UCL	0.654	95% Bootstrap t UCL	1.137
95% H-UCL (Log ROS)	11.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.714	KM Geo Mean	0.18
KM SD (logged)	1.215	95% Critical H Value (KM-Log)	3.974
KM Standard Error of Mean (logged)	0.47	95% H-UCL (KM -Log)	2.334
KM SD (logged)	1.215	95% Critical H Value (KM-Log)	3.974
KM Standard Error of Mean (logged)	0.47		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.356	Mean in Log Scale	-1.879
SD in Original Scale	0.447	SD in Log Scale	1.526
95% t UCL (Assumes normality)	0.656	95% H-Stat UCL	7.836

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	0.665

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDE (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.038	Minimum Non-Detect	0.0092
Maximum Detect	0.7	Maximum Non-Detect	0.48
Variance Detects	0.103	Percent Non-Detects	50%
Mean Detects	0.219	SD Detects	0.321
Median Detects	0.0695	CV Detects	1.465
Skewness Detects	1.977	Kurtosis Detects	3.92
Mean of Logged Detects	-2.254	SD of Logged Detects	1.309

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.685	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.411	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.122	KM Standard Error of Mean	0.0902
KM SD	0.22	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.293	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.27	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.392	95% KM Chebyshev UCL	0.515
97.5% KM Chebyshev UCL	0.685	99% KM Chebyshev UCL	1.019

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.604	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.669	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.38	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.404	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)	0.805	k star (bias corrected MLE)	0.368
Theta hat (MLE)	0.272	Theta star (bias corrected MLE)	0.596
nu hat (MLE)	6.438	nu star (bias corrected)	2.943

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	0.219

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.115
Maximum	0.7	Median	0.024
SD	0.238	CV	2.077
k hat (MLE)	0.502	k star (bias corrected MLE)	0.397
Theta hat (MLE)	0.228	Theta star (bias corrected MLE)	0.289
nu hat (MLE)	8.036	nu star (bias corrected)	6.356
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.36, α)	1.824	Adjusted Chi Square Value (6.36, β)	1.277
95% Gamma Approximate UCL (use when n>=50)	0.399	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.122	SD (KM)	0.22
Variance (KM)	0.0485	SE of Mean (KM)	0.0902
k hat (KM)	0.305	k star (KM)	0.274
nu hat (KM)	4.885	nu star (KM)	4.386
theta hat (KM)	0.399	theta star (KM)	0.444
80% gamma percentile (KM)	0.182	90% gamma percentile (KM)	0.362
95% gamma percentile (KM)	0.573	99% gamma percentile (KM)	1.126

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.39, α)	0.88	Adjusted Chi Square Value (4.39, β)	0.554
95% Gamma Approximate KM-UCL (use when n>=50)	0.607	95% Gamma Adjusted KM-UCL (use when n<50)	0.963

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.845	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.31	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.117	Mean in Log Scale	-3.344
SD in Original Scale	0.237	SD in Log Scale	1.549
95% t UCL (assumes normality of ROS data)	0.276	95% Percentile Bootstrap UCL	0.278
95% BCA Bootstrap UCL	0.358	95% Bootstrap t UCL	1.385
95% H-UCL (Log ROS)	2.037		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.201	KM Geo Mean	0.0407
KM SD (logged)	1.377	95% Critical H Value (KM-Log)	4.406
KM Standard Error of Mean (logged)	0.605	95% H-UCL (KM -Log)	1.041
KM SD (logged)	1.377	95% Critical H Value (KM-Log)	4.406
KM Standard Error of Mean (logged)	0.605		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.171	Mean in Log Scale	-2.718
SD in Original Scale	0.233	SD in Log Scale	1.666
95% t UCL (Assumes normality)	0.327	95% H-Stat UCL	6.978

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 Bootstrap t UCL	N/A	djusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	0.963

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'-DDE (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.0074	Minimum Non-Detect	0.0041
Maximum Detect	0.72	Maximum Non-Detect	4.2
Variance Detects	0.0801	Percent Non-Detects	44.44%
Mean Detects	0.231	SD Detects	0.283
Median Detects	0.18	CV Detects	1.222
Skewness Detects	1.855	Kurtosis Detects	3.734
Mean of Logged Detects	-2.265	SD of Logged Detects	1.695

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.781	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.372	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data Not 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

KM Mean	0.155	KM Standard Error of Mean	0.09
KM SD	0.226	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.322	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.303	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.425	95% KM Chebyshev UCL	0.547
97.5% KM Chebyshev UCL	0.717	99% KM Chebyshev UCL	1.051

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.264	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.226	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.367	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)	0.747	k star (bias corrected MLE)	0.432
Theta hat (MLE)	0.31	Theta star (bias corrected MLE)	0.536
nu hat (MLE)	7.473	nu star (bias corrected)	4.322
Mean (detects)	0.231		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0074	Mean	0.137
Maximum	0.72	Median	0.0441
SD	0.23	CV	1.676
k hat (MLE)	0.55	k star (bias corrected MLE)	0.441
Theta hat (MLE)	0.249	Theta star (bias corrected MLE)	0.311
nu hat (MLE)	9.895	nu star (bias corrected)	7.93
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (7.93, α)	2.695	Adjusted Chi Square Value (7.93, β)	2.095
95% Gamma Approximate UCL (use when n>=50)	0.403	95% Gamma Adjusted UCL (use when n<50)	0.518

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.155	SD (KM)	0.226
Variance (KM)	0.051	SE of Mean (KM)	0.09
k hat (KM)	0.471	k star (KM)	0.388
nu hat (KM)	8.485	nu star (KM)	6.99
theta hat (KM)	0.329	theta star (KM)	0.399
80% gamma percentile (KM)	0.249	90% gamma percentile (KM)	0.44
95% gamma percentile (KM)	0.651	99% gamma percentile (KM)	1.182

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.99, α)	2.165	Adjusted Chi Square Value (6.99, β)	1.644
95% Gamma Approximate KM-UCL (use when n>=50)	0.5	95% Gamma Adjusted KM-UCL (use when n<50)	0.659

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	0.136	Mean in Log Scale	-3.31
SD in Original Scale	0.23	SD in Log Scale	1.89
95% t UCL (assumes normality of ROS data)	0.279	95% Percentile Bootstrap UCL	0.276
95% BCA Bootstrap UCL	0.341	95% Bootstrap t UCL	0.535
95% H-UCL (Log ROS)	8.184		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.248	KM Geo Mean	0.0389
KM SD (logged)	1.918	95% Critical H Value (KM-Log)	5.495
KM Standard Error of Mean (logged)	0.799	95% H-UCL (KM -Log)	10.14
KM SD (logged)	1.918	95% Critical H Value (KM-Log)	5.495
KM Standard Error of Mean (logged)	0.799		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.387	Mean in Log Scale	-2.704
SD in Original Scale	0.68	SD in Log Scale	2.483
95% t UCL (Assumes normality)	0.809	95% H-Stat UCL	665.3

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.322

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.055	Minimum Non-Detect	0.048
Maximum Detect	2	Maximum Non-Detect	0.22
Variance Detects	0.566	Percent Non-Detects	37.5%
Mean Detects	0.781	SD Detects	0.752
Median Detects	0.68	CV Detects	0.963
Skewness Detects	1.29	Kurtosis Detects	1.922
Mean of Logged Detects	-0.787	SD of Logged Detects	1.361

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.507	KM Standard Error of Mean	0.252
KM SD	0.639	95% KM (BCA) UCL	0.901
95% KM (t) UCL	0.985	95% KM (Percentile Bootstrap) UCL	0.939
95% KM (z) UCL	0.922	95% KM Bootstrap t UCL	1.241
90% KM Chebyshev UCL	1.264	95% KM Chebyshev UCL	1.608
97.5% KM Chebyshev UCL	2.084	99% KM Chebyshev UCL	3.019

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.191	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.691	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.176	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.364	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)	1.061	k star (bias corrected MLE)	0.558
Theta hat (MLE)	0.736	Theta star (bias corrected MLE)	1.4
nu hat (MLE)	10.61	nu star (bias corrected)	5.579
Mean (detects)	0.781		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.492
Maximum	2	Median	0.178
SD	0.695	CV	1.412
k hat (MLE)	0.431	k star (bias corrected MLE)	0.353
Theta hat (MLE)	1.142	Theta star (bias corrected MLE)	1.395
nu hat (MLE)	6.893	nu star (bias corrected)	5.641
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.64, α)	1.459	Adjusted Chi Square Value (5.64, β)	0.99
95% Gamma Approximate UCL (use when n>=50)	1.901	95% Gamma Adjusted UCL (use when n<50)	2.804

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.507	SD (KM)	0.639
Variance (KM)	0.408	SE of Mean (KM)	0.252
k hat (KM)	0.63	k star (KM)	0.477
nu hat (KM)	10.08	nu star (KM)	7.634
theta hat (KM)	0.805	theta star (KM)	1.063
80% gamma percentile (KM)	0.831	90% gamma percentile (KM)	1.385
95% gamma percentile (KM)	1.98	99% gamma percentile (KM)	3.451

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.63, α)	2.525	Adjusted Chi Square Value (7.63, β)	1.846
95% Gamma Approximate KM-UCL (use when n>=50)	1.533	95% Gamma Adjusted KM-UCL (use when n<50)	2.097

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	0.498	Mean in Log Scale	-1.905
SD in Original Scale	0.69	SD in Log Scale	1.883
95% t UCL (assumes normality of ROS data)	0.96	95% Percentile Bootstrap UCL	0.911
95% BCA Bootstrap UCL	1.037	95% Bootstrap t UCL	1.427
95% H-UCL (Log ROS)	54.52		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.614	KM Geo Mean	0.199
KM SD (logged)	1.438	95% Critical H Value (KM-Log)	4.57
KM Standard Error of Mean (logged)	0.569	95% H-UCL (KM -Log)	6.703
KM SD (logged)	1.438	95% Critical H Value (KM-Log)	4.57
KM Standard Error of Mean (logged)	0.569		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.51	Mean in Log Scale	-1.626
SD in Original Scale	0.681	SD in Log Scale	1.602
95% t UCL (Assumes normality)	0.966	95% H-Stat UCL	14.86

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	0.985

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.091	Mean	4.855
Maximum	19	Median	0.69
SD	7.874	Std. Error of Mean	2.784
Coefficient of Variation	1.622	Skewness	1.454

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.654	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.387	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	10.13	95% Adjusted-CLT UCL (Chen-1995)	10.96
		95% Modified-t UCL (Johnson-1978)	10.37

Gamma GOF Test

A-D Test Statistic	0.667	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.782	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.213	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.39	k star (bias corrected MLE)	0.327
Theta hat (MLE)	12.46	Theta star (bias corrected MLE)	14.85
nu hat (MLE)	6.236	nu star (bias corrected)	5.231
MLE Mean (bias corrected)	4.855	MLE Sd (bias corrected)	8.491
		Approximate Chi Square Value (0.05)	1.26
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	0.837

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	20.15	95% Adjusted Gamma UCL (use when n<50)	30.35

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.397	Mean of logged Data	-0.115
Maximum of Logged Data	2.944	SD of logged Data	2.124

Assuming Lognormal Distribution

95% H-UCL	1551	90% Chebyshev (MVUE) UCL	14.85
95% Chebyshev (MVUE) UCL	19.43	97.5% Chebyshev (MVUE) UCL	25.79
99% Chebyshev (MVUE) UCL	38.27		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	9.434	95% Jackknife UCL	10.13
95% Standard Bootstrap UCL	9.205	95% Bootstrap-t UCL	52.33
95% Hall's Bootstrap UCL	52.99	95% Percentile Bootstrap UCL	9.47
95% BCA Bootstrap UCL	10.2		
90% Chebyshev(Mean, Sd) UCL	13.21	95% Chebyshev(Mean, Sd) UCL	16.99
97.5% Chebyshev(Mean, Sd) UCL	22.24	99% Chebyshev(Mean, Sd) UCL	32.56

Suggested UCL to Use

95% Adjusted Gamma UCL 30.35

Recommended UCL exceeds the maximum observation

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.012	Minimum Non-Detect	0.009
Maximum Detect	19	Maximum Non-Detect	0.046
Variance Detects	83.39	Percent Non-Detects	50%
Mean Detects	5.422	SD Detects	9.132
Median Detects	1.338	CV Detects	1.684
Skewness Detects	1.899	Kurtosis Detects	3.625
Mean of Logged Detects	-0.778	SD of Logged Detects	3.338

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.725	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.371	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	2.716	KM Standard Error of Mean	2.536
KM SD	6.212	95% KM (BCA) UCL	N/A
95% KM (t) UCL	7.521	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	6.888	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	10.32	95% KM Chebyshev UCL	13.77
97.5% KM Chebyshev UCL	18.55	99% KM Chebyshev UCL	27.95

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.282	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.709	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.268	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.419	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)	0.282	k star (bias corrected MLE)	0.237
Theta hat (MLE)	19.22	Theta star (bias corrected MLE)	22.86
nu hat (MLE)	2.257	nu star (bias corrected)	1.898

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	5.422

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.716
Maximum	19	Median	0.011
SD	6.641	CV	2.445
k hat (MLE)	0.199	k star (bias corrected MLE)	0.208
Theta hat (MLE)	13.62	Theta star (bias corrected MLE)	13.06
nu hat (MLE)	3.192	nu star (bias corrected)	3.328
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.33, α)	0.476	Adjusted Chi Square Value (3.33, β)	0.278
95% Gamma Approximate UCL (use when n>=50)	18.99	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.716	SD (KM)	6.212
Variance (KM)	38.59	SE of Mean (KM)	2.536
k hat (KM)	0.191	k star (KM)	0.203
nu hat (KM)	3.058	nu star (KM)	3.245
theta hat (KM)	14.21	theta star (KM)	13.39
80% gamma percentile (KM)	3.605	90% gamma percentile (KM)	8.215
95% gamma percentile (KM)	13.94	99% gamma percentile (KM)	29.68

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.24, α)	0.448	Adjusted Chi Square Value (3.24, β)	0.26
95% Gamma Approximate KM-UCL (use when n>=50)	19.65	95% Gamma Adjusted KM-UCL (use when n<50)	33.84

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	2.711	Mean in Log Scale	-4.364
SD in Original Scale	6.643	SD in Log Scale	4.591
95% t UCL (assumes normality of ROS data)	7.161	95% Percentile Bootstrap UCL	7.135
95% BCA Bootstrap UCL	9.509	95% Bootstrap t UCL	691.6
95% H-UCL (Log ROS)	9.212E+12		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.69	KM Geo Mean	0.0678
KM SD (logged)	2.801	95% Critical H Value (KM-Log)	8.43
KM Standard Error of Mean (logged)	1.145	95% H-UCL (KM -Log)	25742
KM SD (logged)	2.801	95% Critical H Value (KM-Log)	8.43
KM Standard Error of Mean (logged)	1.145		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.72	Mean in Log Scale	-2.485
SD in Original Scale	6.64	SD in Log Scale	2.896
95% t UCL (Assumes normality)	7.167	95% H-Stat UCL	75521

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 7.521

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.14	Minimum Non-Detect	0.046
Maximum Detect	1100	Maximum Non-Detect	0.046
Variance Detects	172027	Percent Non-Detects	12.5%
Mean Detects	159.4	SD Detects	414.8
Median Detects	0.76	CV Detects	2.601
Skewness Detects	2.645	Kurtosis Detects	6.998
Mean of Logged Detects	1.022	SD of Logged Detects	2.982

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.46	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.497	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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

KM Mean	139.5	KM Standard Error of Mean	138.6
KM SD	363	95% KM (BCA) UCL	278.6
95% KM (t) UCL	402.2	95% KM (Percentile Bootstrap) UCL	413.1
95% KM (z) UCL	367.6	95% KM Bootstrap t UCL	53230
90% KM Chebyshev UCL	555.4	95% KM Chebyshev UCL	743.8
97.5% KM Chebyshev UCL	1005	99% KM Chebyshev UCL	1519

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.178	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.837	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.373	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.344	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)	0.184	k star (bias corrected MLE)	0.2
Theta hat (MLE)	866.2	Theta star (bias corrected MLE)	795.5
nu hat (MLE)	2.577	nu star (bias corrected)	2.806
Mean (detects)	159.4		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	139.5
Maximum	1100	Median	0.695
SD	388.1	CV	2.782
k hat (MLE)	0.164	k star (bias corrected MLE)	0.186
Theta hat (MLE)	849.8	Theta star (bias corrected MLE)	750.3
nu hat (MLE)	2.627	nu star (bias corrected)	2.975
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (2.98, α)	0.365	Adjusted Chi Square Value (2.98, β)	0.21
95% Gamma Approximate UCL (use when n>=50)	1137	95% Gamma Adjusted UCL (use when n<50)	1979

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	139.5	SD (KM)	363
Variance (KM)	131800	SE of Mean (KM)	138.6
k hat (KM)	0.148	k star (KM)	0.176
nu hat (KM)	2.363	nu star (KM)	2.81
theta hat (KM)	944.6	theta star (KM)	794.3
80% gamma percentile (KM)	170.4	90% gamma percentile (KM)	420.2
95% gamma percentile (KM)	742.4	99% gamma percentile (KM)	1649

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.81, α)	0.319	Adjusted Chi Square Value (2.81, β)	0.183
95% Gamma Approximate KM-UCL (use when n>=50)	1231	95% Gamma Adjusted KM-UCL (use when n<50)	2144

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.852	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.24	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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	139.5	Mean in Log Scale	0.142
SD in Original Scale	388.1	SD in Log Scale	3.717
95% t UCL (assumes normality of ROS data)	399.5	95% Percentile Bootstrap UCL	413.3
95% BCA Bootstrap UCL	416	95% Bootstrap t UCL	54672
95% H-UCL (Log ROS)	6.783E+9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.51	KM Geo Mean	1.665
KM SD (logged)	2.917	95% Critical H Value (KM-Log)	8.766
KM Standard Error of Mean (logged)	1.114	95% H-UCL (KM -Log)	1850004
KM SD (logged)	2.917	95% Critical H Value (KM-Log)	8.766
KM Standard Error of Mean (logged)	1.114		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	139.5	Mean in Log Scale	0.423
SD in Original Scale	388.1	SD in Log Scale	3.24
95% t UCL (Assumes normality)	399.5	95% H-Stat UCL	41977852

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

99% KM (Chebyshev) UCL 1519

Warning: Recommended UCL exceeds the maximum observation

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 (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	2	Number of Non-Detects	3
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	0.029	Minimum Non-Detect	0.0087
Maximum Detect	0.19	Maximum Non-Detect	0.042
Variance Detects	0.013	Percent Non-Detects	60%
Mean Detects	0.11	SD Detects	0.114
Median Detects	0.11	CV Detects	1.04
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.601	SD of Logged Detects	1.329

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.0504	KM Standard Error of Mean	0.0446
KM SD	0.0703	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.145	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.124	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.184	95% KM Chebyshev UCL	0.245
97.5% KM Chebyshev UCL	0.329	99% KM Chebyshev UCL	0.494

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.43	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0766	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.72	nu star (bias corrected)	N/A
Mean (detects)	0.11		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0504	SD (KM)	0.0703
Variance (KM)	0.00495	SE of Mean (KM)	0.0446
k hat (KM)	0.513	k star (KM)	0.338
nu hat (KM)	5.129	nu star (KM)	3.385
theta hat (KM)	0.0982	theta star (KM)	0.149
80% gamma percentile (KM)	0.0793	90% gamma percentile (KM)	0.146
95% gamma percentile (KM)	0.222	99% gamma percentile (KM)	0.414

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0086
Approximate Chi Square Value (3.38, α)	0.495	Adjusted Chi Square Value (3.38, β)	0.19
95% Gamma Approximate KM-UCL (use when n>=50)	0.344	95% Gamma Adjusted KM-UCL (use when n<50)	0.899

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	0.0462	Mean in Log Scale	-4.398
SD in Original Scale	0.0811	SD in Log Scale	1.801
95% t UCL (assumes normality of ROS data)	0.124	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	129.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.807	KM Geo Mean	0.0222
KM SD (logged)	1.187	95% Critical H Value (KM-Log)	5.721
KM Standard Error of Mean (logged)	0.773	95% H-UCL (KM -Log)	1.341
KM SD (logged)	1.187	95% Critical H Value (KM-Log)	5.721
KM Standard Error of Mean (logged)	0.773		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.051	Mean in Log Scale	-3.812
SD in Original Scale	0.0783	SD in Log Scale	1.405
95% t UCL (Assumes normality)	0.126	95% H-Stat UCL	6.553

DL/2 is not a recommended method, provided for comparisons and historical reasons

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.245

Warning: Recommended UCL exceeds the maximum observation

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 (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.012	Minimum Non-Detect	0.0046
Maximum Detect	0.38	Maximum Non-Detect	0.022
Variance Detects	0.0188	Percent Non-Detects	25%
Mean Detects	0.114	SD Detects	0.137
Median Detects	0.0545	CV Detects	1.203
Skewness Detects	1.978	Kurtosis Detects	3.983
Mean of Logged Detects	-2.722	SD of Logged Detects	1.167

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.745	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.323	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	0.0871	KM Standard Error of Mean	0.0457
KM SD	0.118	95% KM (BCA) UCL	0.168
95% KM (t) UCL	0.174	95% KM (Percentile Bootstrap) UCL	0.169
95% KM (z) UCL	0.162	95% KM Bootstrap t UCL	0.397
90% KM Chebyshev UCL	0.224	95% KM Chebyshev UCL	0.286
97.5% KM Chebyshev UCL	0.373	99% KM Chebyshev UCL	0.542

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.357	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.714	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.271	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.341	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)	1.044	k star (bias corrected MLE)	0.633
Theta hat (MLE)	0.109	Theta star (bias corrected MLE)	0.18
nu hat (MLE)	12.53	nu star (bias corrected)	7.599
Mean (detects)	0.114		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.088
Maximum	0.38	Median	0.0465
SD	0.125	CV	1.426
k hat (MLE)	0.781	k star (bias corrected MLE)	0.572
Theta hat (MLE)	0.113	Theta star (bias corrected MLE)	0.154
nu hat (MLE)	12.5	nu star (bias corrected)	9.146
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (9.15, α)	3.416	Adjusted Chi Square Value (9.15, β)	2.591
95% Gamma Approximate UCL (use when n>=50)	0.236	95% Gamma Adjusted UCL (use when n<50)	0.311

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0871	SD (KM)	0.118
Variance (KM)	0.0139	SE of Mean (KM)	0.0457
k hat (KM)	0.545	k star (KM)	0.424
nu hat (KM)	8.722	nu star (KM)	6.784
theta hat (KM)	0.16	theta star (KM)	0.205
80% gamma percentile (KM)	0.141	90% gamma percentile (KM)	0.243
95% gamma percentile (KM)	0.355	99% gamma percentile (KM)	0.633

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.78, α)	2.053	Adjusted Chi Square Value (6.78, β)	1.461
95% Gamma Approximate KM-UCL (use when n>=50)	0.288	95% Gamma Adjusted KM-UCL (use when n<50)	0.405

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.204	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	0.0868	Mean in Log Scale	-3.366
SD in Original Scale	0.126	SD in Log Scale	1.562
95% t UCL (assumes normality of ROS data)	0.171	95% Percentile Bootstrap UCL	0.164
95% BCA Bootstrap UCL	0.191	95% Bootstrap t UCL	0.403
95% H-UCL (Log ROS)	2.124		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.327	KM Geo Mean	0.0359
KM SD (logged)	1.412	95% Critical H Value (KM-Log)	4.5
KM Standard Error of Mean (logged)	0.553	95% H-UCL (KM -Log)	1.073
KM SD (logged)	1.412	95% Critical H Value (KM-Log)	4.5
KM Standard Error of Mean (logged)	0.553		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0872	Mean in Log Scale	-3.364
SD in Original Scale	0.126	SD in Log Scale	1.601
95% t UCL (Assumes normality)	0.172	95% H-Stat UCL	2.599

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	0.174

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

4,4'-DDT (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	2
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.064	Minimum Non-Detect	0.042
Maximum Detect	17	Maximum Non-Detect	0.045
Variance Detects	45.88	Percent Non-Detects	25%
Mean Detects	3.196	SD Detects	6.774
Median Detects	0.435	CV Detects	2.12
Skewness Detects	2.432	Kurtosis Detects	5.932
Mean of Logged Detects	-0.608	SD of Logged Detects	1.969

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.546	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.455	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	2.407	KM Standard Error of Mean	2.14
KM SD	5.526	95% KM (BCA) UCL	6.466
95% KM (t) UCL	6.462	95% KM (Percentile Bootstrap) UCL	6.5
95% KM (z) UCL	5.928	95% KM Bootstrap t UCL	66.53
90% KM Chebyshev UCL	8.828	95% KM Chebyshev UCL	11.74
97.5% KM Chebyshev UCL	15.77	99% KM Chebyshev UCL	23.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.691	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.329	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.354	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)	0.376	k star (bias corrected MLE)	0.299
Theta hat (MLE)	8.51	Theta star (bias corrected MLE)	10.69
nu hat (MLE)	4.506	nu star (bias corrected)	3.587

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean (detects)	3.196

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.399
Maximum	17	Median	0.195
SD	5.912	CV	2.464
k hat (MLE)	0.281	k star (bias corrected MLE)	0.259
Theta hat (MLE)	8.546	Theta star (bias corrected MLE)	9.27
nu hat (MLE)	4.492	nu star (bias corrected)	4.141
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (4.14, α)	0.778	Adjusted Chi Square Value (4.14, β)	0.482
95% Gamma Approximate UCL (use when n>=50)	12.77	95% Gamma Adjusted UCL (use when n<50)	20.63

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.407	SD (KM)	5.526
Variance (KM)	30.54	SE of Mean (KM)	2.14
k hat (KM)	0.19	k star (KM)	0.202
nu hat (KM)	3.036	nu star (KM)	3.231
theta hat (KM)	12.69	theta star (KM)	11.92
80% gamma percentile (KM)	3.188	90% gamma percentile (KM)	7.281
95% gamma percentile (KM)	12.37	99% gamma percentile (KM)	26.37

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.23, α)	0.444	Adjusted Chi Square Value (3.23, β)	0.258
95% Gamma Approximate KM-UCL (use when n>=50)	17.52	95% Gamma Adjusted KM-UCL (use when n<50)	30.19

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	2.398	Mean in Log Scale	-1.847
SD in Original Scale	5.912	SD in Log Scale	2.834
95% t UCL (assumes normality of ROS data)	6.358	95% Percentile Bootstrap UCL	6.522
95% BCA Bootstrap UCL	8.611	95% Bootstrap t UCL	66.23
95% H-UCL (Log ROS)	80821		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.249	KM Geo Mean	0.287
KM SD (logged)	1.911	95% Critical H Value (KM-Log)	5.885
KM Standard Error of Mean (logged)	0.74	95% H-UCL (KM -Log)	125.1
KM SD (logged)	1.911	95% Critical H Value (KM-Log)	5.885
KM Standard Error of Mean (logged)	0.74		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.402	Mean in Log Scale	-1.414
SD in Original Scale	5.91	SD in Log Scale	2.234
95% t UCL (Assumes normality)	6.361	95% H-Stat UCL	921

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 Bootstrap t UCL	66.53	djusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	30.19

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 (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.014	Minimum Non-Detect	0.0092
Maximum Detect	8	Maximum Non-Detect	0.48
Variance Detects	15.85	Percent Non-Detects	50%
Mean Detects	2.029	SD Detects	3.981
Median Detects	0.051	CV Detects	1.962
Skewness Detects	2	Kurtosis Detects	3.999
Mean of Logged Detects	-2.055	SD of Logged Detects	2.828

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.635	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.439	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	1.024	KM Standard Error of Mean	1.076
KM SD	2.637	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.063	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.795	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	4.253	95% KM Chebyshev UCL	5.716
97.5% KM Chebyshev UCL	7.747	99% KM Chebyshev UCL	11.73

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.678	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.428	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.421	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.256	k star (bias corrected MLE)	0.231
Theta hat (MLE)	7.922	Theta star (bias corrected MLE)	8.795
nu hat (MLE)	2.049	nu star (bias corrected)	1.846
Mean (detects)	2.029		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.02
Maximum	8	Median	0.012
SD	2.821	CV	2.767
k hat (MLE)	0.217	k star (bias corrected MLE)	0.219
Theta hat (MLE)	4.7	Theta star (bias corrected MLE)	4.657
nu hat (MLE)	3.471	nu star (bias corrected)	3.503
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.50, α)	0.536	Adjusted Chi Square Value (3.50, β)	0.316
95% Gamma Approximate UCL (use when n>=50)	6.666	95% Gamma Adjusted UCL (use when n<50)	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.024	SD (KM)	2.637
Variance (KM)	6.953	SE of Mean (KM)	1.076
k hat (KM)	0.151	k star (KM)	0.178
nu hat (KM)	2.413	nu star (KM)	2.841
theta hat (KM)	6.79	theta star (KM)	5.766
80% gamma percentile (KM)	1.26	90% gamma percentile (KM)	3.086
95% gamma percentile (KM)	5.434	99% gamma percentile (KM)	12.03

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.84, α)	0.327	Adjusted Chi Square Value (2.84, β)	0.188
95% Gamma Approximate KM-UCL (use when n>=50)	8.897	95% Gamma Adjusted KM-UCL (use when n<50)	15.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.345	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	1.017	Mean in Log Scale	-4.007
SD in Original Scale	2.822	SD in Log Scale	2.988
95% t UCL (assumes normality of ROS data)	2.907	95% Percentile Bootstrap UCL	3.008
95% BCA Bootstrap UCL	4.006	95% Bootstrap t UCL	231.7
95% H-UCL (Log ROS)	39806		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.147	KM Geo Mean	0.043
KM SD (logged)	2.098	95% Critical H Value (KM-Log)	6.413
KM Standard Error of Mean (logged)	0.877	95% H-UCL (KM -Log)	62.83
KM SD (logged)	2.098	95% Critical H Value (KM-Log)	6.413
KM Standard Error of Mean (logged)	0.877		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.076	Mean in Log Scale	-2.618
SD in Original Scale	2.799	SD in Log Scale	2.363
95% t UCL (Assumes normality)	2.951	95% H-Stat UCL	720.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM Bootstrap t UCL N/A djusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 15.5

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	4
Minimum Detect	0.16	Minimum Non-Detect	0.0041
Maximum Detect	340	Maximum Non-Detect	0.45
Variance Detects	21376	Percent Non-Detects	44.44%
Mean Detects	85.86	SD Detects	146.2
Median Detects	6.5	CV Detects	1.703
Skewness Detects	1.955	Kurtosis Detects	3.811
Mean of Logged Detects	1.969	SD of Logged Detects	3.204

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.705	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.311	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	47.71	KM Standard Error of Mean	39.65
KM SD	106.4	95% KM (BCA) UCL	114.2
95% KM (t) UCL	121.4	95% KM (Percentile Bootstrap) UCL	114.9
95% KM (z) UCL	112.9	95% KM Bootstrap t UCL	1836
90% KM Chebyshev UCL	166.7	95% KM Chebyshev UCL	220.5
97.5% KM Chebyshev UCL	295.3	99% KM Chebyshev UCL	442.2

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.284	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.225	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.382	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)	0.281	k star (bias corrected MLE)	0.246
Theta hat (MLE)	305.9	Theta star (bias corrected MLE)	349.6
nu hat (MLE)	2.806	nu star (bias corrected)	2.456
Mean (detects)	85.86		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	47.71
Maximum	340	Median	0.16
SD	112.9	CV	2.366
k hat (MLE)	0.158	k star (bias corrected MLE)	0.18
Theta hat (MLE)	301.4	Theta star (bias corrected MLE)	265.6
nu hat (MLE)	2.849	nu star (bias corrected)	3.233
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.23, α)	0.445	Adjusted Chi Square Value (3.23, β)	0.283
95% Gamma Approximate UCL (use when n>=50)	346.9	95% Gamma Adjusted UCL (use when n<50)	544.5

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	47.71	SD (KM)	106.4
Variance (KM)	11320	SE of Mean (KM)	39.65
k hat (KM)	0.201	k star (KM)	0.208
nu hat (KM)	3.619	nu star (KM)	3.746
theta hat (KM)	237.3	theta star (KM)	229.2
80% gamma percentile (KM)	64.15	90% gamma percentile (KM)	144.3
95% gamma percentile (KM)	243.2	99% gamma percentile (KM)	514

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.75, α)	0.624	Adjusted Chi Square Value (3.75, β)	0.41
95% Gamma Approximate KM-UCL (use when n>=50)	286.4	95% Gamma Adjusted KM-UCL (use when n<50)	436.2

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	47.7	Mean in Log Scale	-1.76
SD in Original Scale	112.9	SD in Log Scale	4.985
95% t UCL (assumes normality of ROS data)	117.7	95% Percentile Bootstrap UCL	114.9
95% BCA Bootstrap UCL	151.9	95% Bootstrap t UCL	2517
95% H-UCL (Log ROS)	1.296E+15		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.247	KM Geo Mean	0.287
KM SD (logged)	4.224	95% Critical H Value (KM-Log)	11.63
KM Standard Error of Mean (logged)	1.59	95% H-UCL (KM -Log)	7.556E+10
KM SD (logged)	4.224	95% Critical H Value (KM-Log)	11.63
KM Standard Error of Mean (logged)	1.59		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	47.73	Mean in Log Scale	-1.12
SD in Original Scale	112.8	SD in Log Scale	4.536
95% t UCL (Assumes normality)	117.7	95% H-Stat UCL	4.711E+12

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 121.4

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-10) was not processed!

alpha-BHC (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 alpha-BHC (sts-11) was not processed!

alpha-BHC (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 alpha-BHC (sts-12) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-13) was not processed!

alpha-BHC (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-14) was not processed!

alpha-BHC (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-15) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-BHC (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-16) was not processed!

alpha-BHC (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-17) was not processed!

alpha-BHC (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	9
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-BHC (sts-18) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-Chlordane (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-Chlordane (sts-10) was not processed!

alpha-Chlordane (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.0087	Minimum Non-Detect	0.0045
Maximum Detect	0.22	Maximum Non-Detect	0.13
Variance Detects	0.0223	Percent Non-Detects	75%
Mean Detects	0.114	SD Detects	0.149
Median Detects	0.114	CV Detects	1.307
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-3.129	SD of Logged Detects	2.284

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

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

KM Mean	0.0333	KM Standard Error of Mean	0.0353
KM SD	0.0706	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.1	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0914	95% KM Bootstrap t UCL	N/A

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

90% KM Chebyshev UCL	0.139	95% KM Chebyshev UCL	0.187
97.5% KM Chebyshev UCL	0.254	99% KM Chebyshev UCL	0.385

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.637	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.179	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.55	nu star (bias corrected)	N/A
Mean (detects)	0.114		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0333	SD (KM)	0.0706
Variance (KM)	0.00498	SE of Mean (KM)	0.0353
k hat (KM)	0.222	k star (KM)	0.222
nu hat (KM)	3.554	nu star (KM)	3.555
theta hat (KM)	0.15	theta star (KM)	0.15
80% gamma percentile (KM)	0.0461	90% gamma percentile (KM)	0.1
95% gamma percentile (KM)	0.167	99% gamma percentile (KM)	0.346

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (3.55, α)	0.554	Adjusted Chi Square Value (3.55, β)	0.328
95% Gamma Approximate KM-UCL (use when n>=50)	0.213	95% Gamma Adjusted KM-UCL (use when n<50)	0.36

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	0.0297	Mean in Log Scale	-5.759
SD in Original Scale	0.0769	SD in Log Scale	1.937
95% t UCL (assumes normality of ROS data)	0.0813	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	1.612		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.629	KM Geo Mean	0.00976
KM SD (logged)	1.217	95% Critical H Value (KM-Log)	3.98
KM Standard Error of Mean (logged)	0.656	95% H-UCL (KM -Log)	0.128
KM SD (logged)	1.217	95% Critical H Value (KM-Log)	3.98
KM Standard Error of Mean (logged)	0.656		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0417	Mean in Log Scale	-4.243
SD in Original Scale	0.0748	SD in Log Scale	1.448
95% t UCL (Assumes normality)	0.0918	95% H-Stat UCL	0.506

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Data do not follow a Discernible Distribution at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

KM Bootstrap t UCL N/A

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 (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 alpha-Chlordane (sts-12) was not processed!

alpha-Chlordane (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 alpha-Chlordane (sts-13) was not processed!

alpha-Chlordane (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

The data set for variable alpha-Chlordane (sts-14) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

alpha-Chlordane (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-Chlordane (sts-15) was not processed!

alpha-Chlordane (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 alpha-Chlordane (sts-16) was not processed!

alpha-Chlordane (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable alpha-Chlordane (sts-17) was not processed!

alpha-Chlordane (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Number of Detects	1	Number of Non-Detects	8
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 alpha-Chlordane (sts-18) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

beta-BHC (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (sts-10) was not processed!

beta-BHC (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 beta-BHC (sts-11) was not processed!

beta-BHC (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.063	Minimum Non-Detect	0.0024
Maximum Detect	0.59	Maximum Non-Detect	0.023
Variance Detects	0.139	Percent Non-Detects	75%
Mean Detects	0.327	SD Detects	0.373
Median Detects	0.327	CV Detects	1.141
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.646	SD of Logged Detects	1.582

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.0834	KM Standard Error of Mean	0.0962
KM SD	0.192	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.266	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.242	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.372	95% KM Chebyshev UCL	0.503
97.5% KM Chebyshev UCL	0.684	99% KM Chebyshev UCL	1.041

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.085	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.301	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.342	nu star (bias corrected)	N/A
Mean (detects)	0.327		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0834	SD (KM)	0.192
Variance (KM)	0.0371	SE of Mean (KM)	0.0962
k hat (KM)	0.188	k star (KM)	0.201
nu hat (KM)	3.005	nu star (KM)	3.212
theta hat (KM)	0.444	theta star (KM)	0.416
80% gamma percentile (KM)	0.11	90% gamma percentile (KM)	0.252
95% gamma percentile (KM)	0.429	99% gamma percentile (KM)	0.917

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (3.21, α)	0.438	Adjusted Chi Square Value (3.21, β)	0.254
95% Gamma Approximate KM-UCL (use when n>=50)	0.612	95% Gamma Adjusted KM-UCL (use when n<50)	1.056

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Mean in Original Scale	0.0817	Mean in Log Scale	-7.702
SD in Original Scale	0.207	SD in Log Scale	3.908
95% t UCL (assumes normality of ROS data)	0.22	95% Percentile Bootstrap UCL	0.221
95% BCA Bootstrap UCL	0.295	95% Bootstrap t UCL	123.7
95% H-UCL (Log ROS)	27873336		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.936	KM Geo Mean	0.00719
KM SD (logged)	1.98	95% Critical H Value (KM-Log)	6.078
KM Standard Error of Mean (logged)	0.99	95% H-UCL (KM -Log)	4.819
KM SD (logged)	1.98	95% Critical H Value (KM-Log)	6.078
KM Standard Error of Mean (logged)	0.99		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0866	Mean in Log Scale	-4.438
SD in Original Scale	0.204	SD in Log Scale	2.013
95% t UCL (Assumes normality)	0.224	95% H-Stat UCL	9.832

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

975% KM (Chebyshev) UCL 0.684

Warning: Recommended UCL exceeds the maximum observation

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.

beta-BHC (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 beta-BHC (sts-13) was not processed!

beta-BHC (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 beta-BHC (sts-14) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

beta-BHC (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (sts-15) was not processed!

beta-BHC (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 beta-BHC (sts-16) was not processed!

beta-BHC (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (sts-17) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

beta-BHC (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	7
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.094	Minimum Non-Detect	0.0021
Maximum Detect	0.46	Maximum Non-Detect	2.1
Variance Detects	0.067	Percent Non-Detects	77.78%
Mean Detects	0.277	SD Detects	0.259
Median Detects	0.277	CV Detects	0.934
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.57	SD of Logged Detects	1.123

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.0727	KM Standard Error of Mean	0.0752
KM SD	0.15	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.213	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.196	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.298	95% KM Chebyshev UCL	0.401
97.5% KM Chebyshev UCL	0.542	99% KM Chebyshev UCL	0.821

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.893	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.146	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.573	nu star (bias corrected)	N/A
Mean (detects)	0.277		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0727	SD (KM)	0.15
Variance (KM)	0.0225	SE of Mean (KM)	0.0752
k hat (KM)	0.236	k star (KM)	0.231
nu hat (KM)	4.242	nu star (KM)	4.161
theta hat (KM)	0.309	theta star (KM)	0.315
80% gamma percentile (KM)	0.103	90% gamma percentile (KM)	0.219
95% gamma percentile (KM)	0.36	99% gamma percentile (KM)	0.74

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0231
Approximate Chi Square Value (4.16, α)	0.786	Adjusted Chi Square Value (4.16, β)	0.53
95% Gamma Approximate KM-UCL (use when n>=50)	0.385	95% Gamma Adjusted KM-UCL (use when n<50)	0.571

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	0.0676	Mean in Log Scale	-4.215
SD in Original Scale	0.15	SD in Log Scale	1.623
95% t UCL (assumes normality of ROS data)	0.161	95% Percentile Bootstrap UCL	0.159
95% BCA Bootstrap UCL	0.217	95% Bootstrap t UCL	2.64
95% H-UCL (Log ROS)	0.841		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.938	KM Geo Mean	0.00717
KM SD (logged)	2.057	95% Critical H Value (KM-Log)	5.857
KM Standard Error of Mean (logged)	1.063	95% H-UCL (KM -Log)	4.204
KM SD (logged)	2.057	95% Critical H Value (KM-Log)	5.857
KM Standard Error of Mean (logged)	1.063		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.195	Mean in Log Scale	-3.761
SD in Original Scale	0.352	SD in Log Scale	2.66
95% t UCL (Assumes normality)	0.414	95% H-Stat UCL	878

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.401

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.

delta-BHC (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-10) was not processed!

delta-BHC (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-11) was not processed!

delta-BHC (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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).

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

The data set for variable delta-BHC (sts-12) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

delta-BHC (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 delta-BHC (sts-13) was not processed!

delta-BHC (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-14) was not processed!

delta-BHC (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-15) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

delta-BHC (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-16) was not processed!

delta-BHC (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable delta-BHC (sts-17) was not processed!

delta-BHC (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	8
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 delta-BHC (sts-18) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Dieldrin (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (sts-10) was not processed!

Dieldrin (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.016	Minimum Non-Detect	0.009
Maximum Detect	0.35	Maximum Non-Detect	0.049
Variance Detects	0.0299	Percent Non-Detects	62.5%
Mean Detects	0.209	SD Detects	0.173
Median Detects	0.26	CV Detects	0.828
Skewness Detects	-1.219	Kurtosis Detects	N/A
Mean of Logged Detects	-2.177	SD of Logged Detects	1.702

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.283	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0856	KM Standard Error of Mean	0.0557
KM SD	0.129	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.191	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.177	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.253	95% KM Chebyshev UCL	0.329
97.5% KM Chebyshev UCL	0.434	99% KM Chebyshev UCL	0.64

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.951	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.219	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.708	nu star (bias corrected)	N/A
Mean (detects)	0.209		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0845
Maximum	0.35	Median	0.01
SD	0.138	CV	1.636
k hat (MLE)	0.516	k star (bias corrected MLE)	0.406
Theta hat (MLE)	0.164	Theta star (bias corrected MLE)	0.208
nu hat (MLE)	8.263	nu star (bias corrected)	6.498
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.50, α)	1.899	Adjusted Chi Square Value (6.50, β)	1.337
95% Gamma Approximate UCL (use when n>=50)	0.289	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0856	SD (KM)	0.129
Variance (KM)	0.0166	SE of Mean (KM)	0.0557
k hat (KM)	0.443	k star (KM)	0.36
nu hat (KM)	7.085	nu star (KM)	5.761
theta hat (KM)	0.193	theta star (KM)	0.238
80% gamma percentile (KM)	0.136	90% gamma percentile (KM)	0.246
95% gamma percentile (KM)	0.369	99% gamma percentile (KM)	0.681

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.76, α)	1.519	Adjusted Chi Square Value (5.76, β)	1.036
95% Gamma Approximate KM-UCL (use when n>=50)	0.325	95% Gamma Adjusted KM-UCL (use when n<50)	0.476

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.354	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.0811	Mean in Log Scale	-4.273
SD in Original Scale	0.14	SD in Log Scale	2.024
95% t UCL (assumes normality of ROS data)	0.175	95% Percentile Bootstrap UCL	0.166
95% BCA Bootstrap UCL	0.177	95% Bootstrap t UCL	2.277
95% H-UCL (Log ROS)	12.46		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.617	KM Geo Mean	0.0269
KM SD (logged)	1.42	95% Critical H Value (KM-Log)	4.523
KM Standard Error of Mean (logged)	0.634	95% H-UCL (KM -Log)	0.835
KM SD (logged)	1.42	95% Critical H Value (KM-Log)	4.523
KM Standard Error of Mean (logged)	0.634		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.088	Mean in Log Scale	-3.515
SD in Original Scale	0.136	SD in Log Scale	1.524
95% t UCL (Assumes normality)	0.179	95% H-Stat UCL	1.513

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	0.191

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.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Dieldrin (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.26	Minimum Non-Detect	0.0048
Maximum Detect	0.9	Maximum Non-Detect	0.046
Variance Detects	0.205	Percent Non-Detects	75%
Mean Detects	0.58	SD Detects	0.453
Median Detects	0.58	CV Detects	0.78
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.726	SD of Logged Detects	0.878

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.149	KM Standard Error of Mean	0.148
KM SD	0.296	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.429	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.392	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.593	95% KM Chebyshev UCL	0.794
97.5% KM Chebyshev UCL	1.073	99% KM Chebyshev UCL	1.621

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.911	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.199	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11.64	nu star (bias corrected)	N/A
Mean (detects)	0.58		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.149	SD (KM)	0.296
Variance (KM)	0.0876	SE of Mean (KM)	0.148
k hat (KM)	0.252	k star (KM)	0.241
nu hat (KM)	4.032	nu star (KM)	3.853
theta hat (KM)	0.59	theta star (KM)	0.617
80% gamma percentile (KM)	0.213	90% gamma percentile (KM)	0.447
95% gamma percentile (KM)	0.727	99% gamma percentile (KM)	1.477

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (3.85, α)	0.665	Adjusted Chi Square Value (3.85, β)	0.403
95% Gamma Approximate KM-UCL (use when n>=50)	0.862	95% Gamma Adjusted KM-UCL (use when n<50)	1.422

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	0.15	Mean in Log Scale	-4.088
SD in Original Scale	0.316	SD in Log Scale	2.169
95% t UCL (assumes normality of ROS data)	0.361	95% Percentile Bootstrap UCL	0.342
95% BCA Bootstrap UCL	0.453	95% Bootstrap t UCL	11.9
95% H-UCL (Log ROS)	39.99		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.186	KM Geo Mean	0.0152
KM SD (logged)	2.021	95% Critical H Value (KM-Log)	6.196
KM Standard Error of Mean (logged)	1.011	95% H-UCL (KM -Log)	13.34
KM SD (logged)	2.021	95% Critical H Value (KM-Log)	6.196
KM Standard Error of Mean (logged)	1.011		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.155	Mean in Log Scale	-3.693
SD in Original Scale	0.313	SD in Log Scale	2.049
95% t UCL (Assumes normality)	0.365	95% H-Stat UCL	26.1

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.794

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.

Dieldrin (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 Dieldrin (sts-13) was not processed!

Dieldrin (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (sts-14) was not processed!

Dieldrin (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

The data set for variable Dieldrin (sts-15) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Dieldrin (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 Dieldrin (sts-16) was not processed!

Dieldrin (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (sts-17) was not processed!

Dieldrin (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	2	Number of Non-Detects	7
Number of Distinct Detects	2	Number of Distinct Non-Detects	7
Minimum Detect	0.15	Minimum Non-Detect	0.0041
Maximum Detect	1.1	Maximum Non-Detect	4.2
Variance Detects	0.451	Percent Non-Detects	77.78%
Mean Detects	0.625	SD Detects	0.672
Median Detects	0.625	CV Detects	1.075
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.901	SD of Logged Detects	1.409

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.162	KM Standard Error of Mean	0.179
KM SD	0.358	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.496	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.457	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.7	95% KM Chebyshev UCL	0.944
97.5% KM Chebyshev UCL	1.282	99% KM Chebyshev UCL	1.947

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.302	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.48	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.207	nu star (bias corrected)	N/A
Mean (detects)	0.625		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.162	SD (KM)	0.358
Variance (KM)	0.128	SE of Mean (KM)	0.179
k hat (KM)	0.206	k star (KM)	0.211
nu hat (KM)	3.702	nu star (KM)	3.801
theta hat (KM)	0.789	theta star (KM)	0.769
80% gamma percentile (KM)	0.22	90% gamma percentile (KM)	0.491
95% gamma percentile (KM)	0.825	99% gamma percentile (KM)	1.735

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0231
Approximate Chi Square Value (3.80, α)	0.645	Adjusted Chi Square Value (3.80, β)	0.425
95% Gamma Approximate KM-UCL (use when n>=50)	0.957	95% Gamma Adjusted KM-UCL (use when n<50)	1.453

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	0.144	Mean in Log Scale	-4.207
SD in Original Scale	0.362	SD in Log Scale	1.97
95% t UCL (assumes normality of ROS data)	0.368	95% Percentile Bootstrap UCL	0.372
95% BCA Bootstrap UCL	0.493	95% Bootstrap t UCL	17.8
95% H-UCL (Log ROS)	5.248		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.273	KM Geo Mean	0.0139
KM SD (logged)	2.074	95% Critical H Value (KM-Log)	5.902

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM Standard Error of Mean (logged)	1.068	95% H-UCL (KM -Log)	9.065
KM SD (logged)	2.074	95% Critical H Value (KM-Log)	5.902
KM Standard Error of Mean (logged)	1.068		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.406	Mean in Log Scale	-3.082
SD in Original Scale	0.726	SD in Log Scale	2.675
95% t UCL (Assumes normality)	0.856	95% H-Stat UCL	1941

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 (Chebyshev) UCL 0.944

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.

gamma-BHC (Lindane) (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-10) was not processed!

gamma-BHC (Lindane) (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-11) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-BHC (Lindane) (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 gamma-BHC (Lindane) (sts-12) was not processed!

gamma-BHC (Lindane) (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 gamma-BHC (Lindane) (sts-13) was not processed!

gamma-BHC (Lindane) (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-14) was not processed!

gamma-BHC (Lindane) (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-15) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-BHC (Lindane) (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-16) was not processed!

gamma-BHC (Lindane) (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-17) was not processed!

gamma-BHC (Lindane) (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	9
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-BHC (Lindane) (sts-18) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-Chlordane (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-Chlordane (sts-10) was not processed!

gamma-Chlordane (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 gamma-Chlordane (sts-11) was not processed!

gamma-Chlordane (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.094	Minimum Non-Detect	0.0024
Maximum Detect	0.84	Maximum Non-Detect	0.023
Variance Detects	0.278	Percent Non-Detects	75%
Mean Detects	0.467	SD Detects	0.528
Median Detects	0.467	CV Detects	1.13
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.269	SD of Logged Detects	1.549

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

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

KM Mean	0.119	KM Standard Error of Mean	0.137
KM SD	0.274	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.378	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.344	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.53	95% KM Chebyshev UCL	0.716
97.5% KM Chebyshev UCL	0.975	99% KM Chebyshev UCL	1.483

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.122	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.416	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.486	nu star (bias corrected)	N/A
Mean (detects)	0.467		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.119	SD (KM)	0.274
Variance (KM)	0.0753	SE of Mean (KM)	0.137
k hat (KM)	0.187	k star (KM)	0.2
nu hat (KM)	2.988	nu star (KM)	3.201
theta hat (KM)	0.635	theta star (KM)	0.593
80% gamma percentile (KM)	0.156	90% gamma percentile (KM)	0.359
95% gamma percentile (KM)	0.611	99% gamma percentile (KM)	1.305

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (3.20, α)	0.434	Adjusted Chi Square Value (3.20, β)	0.252
95% Gamma Approximate KM-UCL (use when n>=50)	0.874	95% Gamma Adjusted KM-UCL (use when n<50)	1.508

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	0.117	Mean in Log Scale	-7.198
SD in Original Scale	0.294	SD in Log Scale	3.826
95% t UCL (assumes normality of ROS data)	0.314	95% Percentile Bootstrap UCL	0.315
95% BCA Bootstrap UCL	0.42	95% Bootstrap t UCL	198.9
95% H-UCL (Log ROS)	16573030		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM Mean (logged)	-4.842	KM Geo Mean	0.00789
KM SD (logged)	2.134	95% Critical H Value (KM-Log)	6.514
KM Standard Error of Mean (logged)	1.067	95% H-UCL (KM -Log)	14.72
KM SD (logged)	2.134	95% Critical H Value (KM-Log)	6.514
KM Standard Error of Mean (logged)	1.067		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.122	Mean in Log Scale	-4.344
SD in Original Scale	0.292	SD in Log Scale	2.161
95% t UCL (Assumes normality)	0.317	95% H-Stat UCL	29.23

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

975% KM (Chebyshev) UCL 0.975

Warning: Recommended UCL exceeds the maximum observation

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.

gamma-Chlordane (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 gamma-Chlordane (sts-13) was not processed!

gamma-Chlordane (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-Chlordane (sts-14) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-Chlordane (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-Chlordane (sts-15) was not processed!

gamma-Chlordane (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 gamma-Chlordane (sts-16) was not processed!

gamma-Chlordane (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable gamma-Chlordane (sts-17) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

gamma-Chlordane (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	7
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.035	Minimum Non-Detect	0.0021
Maximum Detect	0.22	Maximum Non-Detect	2.1
Variance Detects	0.0171	Percent Non-Detects	77.78%
Mean Detects	0.128	SD Detects	0.131
Median Detects	0.128	CV Detects	1.026
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.433	SD of Logged Detects	1.3

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.0389	KM Standard Error of Mean	0.0402
KM SD	0.0749	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.114	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.105	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.159	95% KM Chebyshev UCL	0.214
97.5% KM Chebyshev UCL	0.29	99% KM Chebyshev UCL	0.439

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.483	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.086	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.931	nu star (bias corrected)	N/A
Mean (detects)	0.128		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0389	SD (KM)	0.0749
Variance (KM)	0.00562	SE of Mean (KM)	0.0402
k hat (KM)	0.269	k star (KM)	0.253
nu hat (KM)	4.842	nu star (KM)	4.561
theta hat (KM)	0.145	theta star (KM)	0.153
80% gamma percentile (KM)	0.0567	90% gamma percentile (KM)	0.117
95% gamma percentile (KM)	0.187	99% gamma percentile (KM)	0.376

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0231
Approximate Chi Square Value (4.56, α)	0.955	Adjusted Chi Square Value (4.56, β)	0.659
95% Gamma Approximate KM-UCL (use when n>=50)	0.186	95% Gamma Adjusted KM-UCL (use when n<50)	0.269

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	0.0308	Mean in Log Scale	-5.142
SD in Original Scale	0.0717	SD in Log Scale	1.711
95% t UCL (assumes normality of ROS data)	0.0753	95% Percentile Bootstrap UCL	0.0758
95% BCA Bootstrap UCL	0.1	95% Bootstrap t UCL	1.26
95% H-UCL (Log ROS)	0.51		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.019	KM Geo Mean	0.00661
KM SD (logged)	1.77	95% Critical H Value (KM-Log)	5.116
KM Standard Error of Mean (logged)	0.978	95% H-UCL (KM -Log)	0.778
KM SD (logged)	1.77	95% Critical H Value (KM-Log)	5.116
KM Standard Error of Mean (logged)	0.978		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.162	Mean in Log Scale	-3.953
SD in Original Scale	0.341	SD in Log Scale	2.516
95% t UCL (Assumes normality)	0.373	95% H-Stat UCL	243

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

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.214

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.

Heptachlor (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-10) was not processed!

Heptachlor (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-11) was not processed!

Heptachlor (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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).

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

The data set for variable Heptachlor (sts-12) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Heptachlor (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-13) was not processed!

Heptachlor (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-14) was not processed!

Heptachlor (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-15) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Heptachlor (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 Heptachlor (sts-16) was not processed!

Heptachlor (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Heptachlor (sts-17) was not processed!

Heptachlor (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	8
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

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 Heptachlor (sts-18) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Methoxychlor (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-10) was not processed!

Methoxychlor (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-11) was not processed!

Methoxychlor (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-12) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Methoxychlor (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-13) was not processed!

Methoxychlor (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-14) was not processed!

Methoxychlor (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-15) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Methoxychlor (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-16) was not processed!

Methoxychlor (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-17) was not processed!

Methoxychlor (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	9
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methoxychlor (sts-18) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Toxaphene (sts-10)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-10) was not processed!

Toxaphene (sts-11)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	2	Number of Non-Detects	6
Number of Distinct Detects	2	Number of Distinct Non-Detects	6
Minimum Detect	0.49	Minimum Non-Detect	0.45
Maximum Detect	1.4	Maximum Non-Detect	130
Variance Detects	0.414	Percent Non-Detects	75%
Mean Detects	0.945	SD Detects	0.643
Median Detects	0.945	CV Detects	0.681
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.188	SD of Logged Detects	0.742

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.78	KM Standard Error of Mean	0.358
KM SD	0.439	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.459	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.369	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.855	95% KM Chebyshev UCL	2.341
97.5% KM Chebyshev UCL	3.017	99% KM Chebyshev UCL	4.344

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3.951	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.239	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	15.8	nu star (bias corrected)	N/A
Mean (detects)	0.945		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.78	SD (KM)	0.439
Variance (KM)	0.192	SE of Mean (KM)	0.358
k hat (KM)	3.161	k star (KM)	2.059
nu hat (KM)	50.58	nu star (KM)	32.94
theta hat (KM)	0.247	theta star (KM)	0.379
80% gamma percentile (KM)	1.164	90% gamma percentile (KM)	1.507
95% gamma percentile (KM)	1.833	99% gamma percentile (KM)	2.556

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0195
Approximate Chi Square Value (32.94, α)	20.82	Adjusted Chi Square Value (32.94, β)	18.42
95% Gamma Approximate KM-UCL (use when n>=50)	1.234	95% Gamma Adjusted KM-UCL (use when n<50)	1.395

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	0.488	Mean in Log Scale	-0.961
SD in Original Scale	0.388	SD in Log Scale	0.788
95% t UCL (assumes normality of ROS data)	0.748	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	1.246		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.392	KM Geo Mean	0.676
KM SD (logged)	0.516	95% Critical H Value (KM-Log)	2.382
KM Standard Error of Mean (logged)	0.421	95% H-UCL (KM -Log)	1.229

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

KM SD (logged)	0.516	95% Critical H Value (KM-Log)	2.382
KM Standard Error of Mean (logged)	0.421		

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	11.97	Mean in Log Scale	0.702
SD in Original Scale	23.1	SD in Log Scale	1.963
95% t UCL (Assumes normality)	27.44	95% H-Stat UCL	1214

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 (Chebyshev) UCL 2.341

Warning: Recommended UCL exceeds the maximum observation

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.

Toxaphene (sts-12)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-12) was not processed!

Toxaphene (sts-13)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-13) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Toxaphene (sts-14)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-14) was not processed!

Toxaphene (sts-15)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-15) was not processed!

Toxaphene (sts-16)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-16) was not processed!

Attachemnt C-1c

ProUCL Output for Surficial Soil - Pesticides by Shrew Exposure Unit

Toxaphene (sts-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-17) was not processed!

Toxaphene (sts-18)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	9
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Toxaphene (sts-18) was not processed!

ATTACHMENT D-1

Post Corrective Action ProUCL Calculations - Surficial Soil by Shrew Soil Exposure Unit

D-1a Post Corrective Action ProUCL Data Set for Surficial Soil by Shrew Exposure Unit

D-1b Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Attachment D-1a
Post Corrective Action ProUCL Data Set for Surficial Soil by Shrew Exposure Unit

SID	LOC_ID	EA_SHREW	CA_GRP	Lead	D_Lead	Lead_R	D_Lead_R	Zinc	D_Zinc	Zinc_R	D_Zinc_R	Arsenic	D_Arsenic	Arsenic_R	D_Arsenic_R	4,4'-DDT	D_4,4'-DDT	4,4'-DDT_R	D_4,4'-DDT_R	beta-BHC	D_beta-BHC	beta-BHC_R	D_beta-BHC_R	4,4'-DDD	D_4,4'-DDD	4,4'-DDD_R	D_4,4'-DDD_R	Dieldrin	D_Dieldrin	Dieldrin_R	D_Dieldrin_R	4,4'-DDE	D_4,4'-DDE	4,4'-DDE_R	D_4,4'-DDE_R
A22 (0-1) 020918	A22	SO-11	REMOVE			412	1			446	1			45.5	1			19	1			0.13	0			0.52	1			0.26	1			3	1
B23 (0-1) 020818	B23	SO-11	REMOVE			300	1			460	1			23.5	1			16	1			0.055	1			1.1	1			0.35	1			1.2	1
C20 (0-1) 020818	C20	SO-09	REMOVE			1330	1			784	1			105	1			1600	1			56	1			27	1			29	1			25	1
C23 (0-1) 020818	C23	SO-12	REMOVE			1210	1			201	1			327	1			0.046	0			0.023	0			0.046	0			0.046	0			0.058	1
C25 (0-1) 020818	C25	SO-12	REMOVE			153	1			96.5	0			288	1			0.009	0			0.0045	0			0.009	0			0.009	0			0.009	0
C26 (0-1) 020818	C26	SO-15	REMOVE			1530	1			1320	1			247	1			0.043	1			0.012	0			0.023	0			0.023	0			0.18	1
C27 (0-1) 020618	C27	SO-15	REMOVE			2130	1			1490	1			449	1			0.38	1			0.15	0			0.3	0			0.3	0			0.52	1
C28 (0-1) 020618	C28	SO-15	REMOVE			499	1			391	1			170	1			0.022	0			0.011	0			0.022	0			0.022	0			0.022	0
C5 (0-1) 021318	C5	SO-01	REMOVE			957	1			601	1			175	1			5.8	1			0.44	1			0.36	1			0.63	1			0.64	1
C6 (0-1) 021318	C6	SO-03	REMOVE			45100	1			401	1			232	1			0.94	1			0.16	1			0.09	0			0.09	0			0.22	1
C8 (0-1) 020918	C8	SO-03	REMOVE			1510	1			893	1			102	1			16	1			1.3	1			0.36	1			0.63	1			1.6	1
D17 (0-1) 020918	D17	SO-07	REMOVE			665	1			153	1			84.6	1			130	1			31	1			7.6	0			24	1			7.6	0
D18 (0-1) 020818	D18	SO-09	REMOVE			3600	1			599	1			312	1			43	0			4.5	1			0.43	0			8.9	1			2.3	1
D20 (0-1) 020818	D20	SO-09	REMOVE			1350	1			960	1			176	1			19	1			0.29	1			0.79	1			1.1	1			1.3	1
D22 (0-1) 020818	D22	SO-12	REMOVE			2550	1			919	1			188	1			19	1			0.59	1			0.88	1			0.9	1			1	1
D26 (0-1) 020818	D26	SO-15	REMOVE			8170	1			210	1			1140	1			0.05	1			0.013	0			0.025	0			0.025	0			0.06	1
D28 (0-1) 020618	D28	SO-15	REMOVE			65600	1			189	1			277	1			0.14	1			0.024	0			0.047	0			0.047	0			0.3	1
D4 (0-1) 021418	D4	SO-01	REMOVE			7080	1			2680	1			664	1			0.038	0			0.019	0			0.038	0			0.038	0			0.038	0
D5 (0-1) 021318	D5	SO-01	REMOVE			7990	1			2310	1			871	1			0.043	0			0.022	0			0.043	0			0.043	0			0.043	0
D8 (0-1) 021318	D8	SO-03	REMOVE			2610	1			3130	1			152	1			1.1	1			0.15	1			0.22	0			0.22	0			0.67	1
E10 (0-1) 020918	E10	SO-06	REMOVE			1410	1			587	1			257	1			2.8	1			0.17	1			0.21	0			0.24	1			2.1	1
E11 (0-1) 020918	E11	SO-06	REMOVE			4340	1			4730	1			495	1			0.96	1			0.21	1			0.2	0			0.28	1			0.33	1
E13 (0-1) 020918	E13	SO-06	REMOVE			2820	1			2050	1			331	1			0.68	1			0.11	0			0.23	0			0.23	0			0.52	1
E15 (0-1) 020918	E15	SO-08	REMOVE			590	1			4620	1			66.4	1			0.21	1			0.022	0			0.043	0			0.043	0			0.14	1
E25 (0-1) 020618	E25	SO-13	REMOVE			13400	1			702	1			386	1			1100	1			2.3	0			22	1			4.5	0			4.5	0
E27 (0-1) 020618	E27	SO-16	REMOVE			78400	1			230	1			253	1			0.25	1			0.025	0			0.049	0			0.049	0			0.4	1
E3 (0-1) 021318	E3	SO-02	REMOVE			2460	1			753	1			221	1			2.1	1			0.26	1			0.095	0			0.56	1			1.2	1
E33 (0-1) 020618	E33	SO-18	REMOVE			120	1			127	1			10.8	1			340	1			2.1	0			10	1			4.2	0			4.2	0
E4 (0-1) 021318	E4	SO-02	REMOVE			1380	1			491	1			154	1			0.38	1			0.049	0			0.097	0			0.097	0			0.35	1
E5 (0-1) 021318	E5	SO-02	REMOVE			2100	1			390	1			196	1			1.5	1			0.42	1			0.1	1			0.21	1			1.3	1
E8 (0-1) 021318	E8	SO-04	REMOVE			8850	1			835	1			573	1			12	1			0.17	1			0.25	1			0.1	1			0.33	1
E9 (0-1) 020918	E9	SO-04	REMOVE			2470	1			788	1			348	1			0.99	1			0.21	0			0.42	0			0.42	0			0.42	0
F10 (0-1) 021318	F10	SO-06	REMOVE			1420	1			764	1			173	1			0.21	0			0.11	0			0.21	0			0.21	0			0.21	0
F13 (0-1) 021318	F13	SO-06	REMOVE			161	1			133	1			308	1			0.97	1			0.2	0			0.41	0			0.41	0			0.41	0
F29 (0-1) 021418	F29	SO-16	REMOVE			344	1			588	1			19.2	1			17	1			0.38	1			0.77	1			15	1			0.71	1
F3 (0-1) 021318	F3	SO-02	REMOVE			10100	1			573	1			2430	1			2.6	1			0.12	0			0.25	0			0.35	1			0.3	1
F31 (0-1) 021418	F31	SO-18	REMOVE			238	1			147	1			27.6	1			82	1			0.46	1			4.5	0			1.1	1			0.72	1
F4 (0-1) 021318	F4	SO-02	REMOVE			2460	1			405	1			295	1			280	1			99	1			15	1			0.26	0			5.9	1
F5 (0-1) 021318	F5	SO-02	REMOVE			2330	1			719	1			158	1			1.9	1			0.29	1			0.24	0			0.24	0			0.75	1
F6 (0-1) 021318	F6	SO-04	REMOVE			5550	1			717	1			286	1			2.3	1			0.17	1			0.072	1			0.18	1			0.44	1
F7 (0-1) 021318	F7	SO-04	REMOVE			5840	1			442	1			345	1			5.8	1			0.13	1			0.17	1			6.1	1			2.2	1
F8 (0-1) 021318	F8	SO-04	REMOVE			15100	1			1530	1			399	1			0.41	1			0.46	1			0.043	0			0.043	0			0.17	1
F9 (0-1) 021318	F9	SO-04	REMOVE			5550	1			1370	1			296	1			0.83	1			0.043	0			0.085	0			0.085	0			0.41	1
A23 (0-1) 020918	A23	SO-11	<LOAELPRGS>	98.5	1		134	1		14	1		0.12	1		0.025	0		0.049	0		0.049	0		0.07	1	
A24 (0-1) 020918	A24	SO-11	<LOAELPRGS>	180	1		524	1		18.4	1		2.1	1		0.012	0		0.051	1		0.023	0		0.16	1	
A25 (0-1) 020918	A25	SO-11	<LOAELPRGS>	102	1		259	1		11.8	1		0.15	1		0.023	0		0.046	0		0.046	0		0.1	1	
A26 (0-1) 020918	A26	SO-14x	<LOAELPRGS>	407	1		168	1		28	1		0.19	1		0.042	0		0.084	0		0.084	0		0.68	1	
B10 (0-1) 020918	B10	SO-05	<LOAELPRGS>	38.6	1		91.8	1		7.46	0		1.9	1		0.12	1		0.21	0		0.21	0		0.67	1	
B11 (0-1) 020918	B11	SO-05	<LOAELPRGS>	38.1	1		84	1		7.44	0		1.1	1		0.11	1		0.079	0		0.079	0		0.24	1	
B12 (0-1) 020918	B12	SO-05	<LOAELPRGS>	204	1		134	1		24.3	1		0.14	1		0.042	0		0.084	0		0.084	0		0.092	1	
B22 (0-1) 020818	B22	SO-11	<LOAELPRGS>	486	1		309	1		74.8	1		0.091	1		0.0045	0		0.009	0		0.009	0		0.078	1	
B24 (0-1) 020818	B24	SO-11	<LOAELPRGS>	126	1		146	1		11.3	1		1	1		0.0047	0		0.078	1		0.016	1		0.99	1	
B25 (0-1) 020818	B25	SO-11	<LOAELPRGS>	257	1		506	1		62	1		0.38	1		0.015	0		0.029	0		0.029	0		0.42	1	
B26 (0-1) 020818	B26	SO-14x	<LOAELPRGS>	71.1	1		101	1		7.4	0		0.0087	0		0.0043	0		0.0087	0		0.0087	0		0.011	1	
B27 (0-1) 020818	B27	SO-14x	<LOAELPRGS>	1030	1		173	1		8.03	1		0.042	0		0.021	0		0.042	0		0.042	0		0.042	0	
B28 (0-1) 020818	B28	SO-14x	<LOAELPRGS>	273	1		677	1		65.9	1		0.029	1		0.016	1		0.027	0		0.027	0		0.036	1	
B29 (0-1) 020818	B29	SO-14x	<LOAELPRGS>	92.8	1		315	1		12.5	1		0.021	0		0.011	0		0.021	0		0.021	0		0.021	0	
C10 (0-1) 021418	C10	SO-05	<LOAELPRGS>	69.2	1		94.5	1		11.3	1		2.6	1		0.095	0		0.23	1		0.19	0		1.1	1	
C11 (0-1) 020918	C11	SO-05	<LOAELPRGS>	37.9	1		61.8	1		7.44	0		0.19	1		0.019	0		0.038	0		0.038	0		0.11	1	
C12 (0-1) 020918	C12	SO-05	<LOAELPRGS>	57.2	1		79.9	1		7.43	0		0.2	1		0.01	0		0.02	0		0.032	1		0.098	1	
C13 (0-1) 020918	C13	SO-05	<LOAELPRGS>	65.7	1		49.7	1		17.2	1		0.069	1		0.022	0		0.044	0		0.044	0		0.044	0	
C14 (0-1) 020918	C14	SO-07	<LOAELPRGS>	126	1		128	1		41.2	1		0.27	1		0.021	0		0.043	0		0.055	1		0.093	1	
C15 (0-1) 020818	C15	SO-07	<LOAELPRGS>	35.4	1		65.6	1		7.46	0		0.3	1		0.021	1		0.024	0		0.024	0		0.024	0	
C16 (0-1) 020818	C16	SO-07	<LOAELPRGS>	56.4	1		67.1	1		7.39	0		0.18	1		0.044	0		0.088	0		0.088	0		0.088	0	
C17 (0-1) 020818	C17	SO-07	<LOAELPRGS>	217	1		215	1		34.6	1		4.9	1		0.84	1		0.44	0		0.44	0		0.79	1	
C18 (0-1) 020818	C18	SO-09	<LOAELPRGS>	14.9	1		32.7	1		7.47	0		0.13	1		0.0036	0		0.0073	0		0.018	1		0.11	1	
C19 (0-1) 020818	C19	SO-09	<LOAELPRGS>	33.8	1		44.4	1		7.4	0		0.12	1		0.0037	1		0.0041	0		0.41	0		0.036	1	
C21 (0-1) 020818	C21	SO-09	<LOAELPRGS>	1340	1		166	1		36.5	1		0.15	1		0.021	1		0.0043	0		0.055	1		0.055	1	
C22 (0-1) 020818	C22	SO-12	<LOAELPRGS>	1320	1		559	1		102	1		2.6	1		0.063	1		0.095	1		0.26	1		0.33	1	
C24 (0-1) 020818	C24	SO-12	<LOAELPRGS>	22.6	1		111	0		11.1	0		0.075	1		0.0024	0		0.0048	0		0.0048	0		0.0048	0	
C29 (0-1) 020618	C29	SO-15	<LOAELPRGS>	122	1		126	1		7.35	0		0.012	1		0.0022	0		0.0043	0		0.0043	0		0.0043	0	
C3 (0-1) 021318	C3	SO-01	<LOAELPRGS>	481	1		445	1		51.2	1		2.6	1		0.11	0		0.22	0		0.22	0		1	1	
C30 (0-1) 020618	C30	SO-17	<LOAELPRGS>	49.7	1		68.6	1		7.14	0		0.0092	0		0.0046	0		0.0092	0		0.0092	0		0.0092	0	
C31 (0-1) 020618	C31	SO-17	<LOAELPRGS>	295	1		134	1		26.2	1		0.023	0		0.011	0		0.023	0		0.023	0		0.023	0	
C32 (0-1) 020618	C32	SO-17	<LOAELPRGS>	997	1		189	1		68.5	1		0.037	1		0.011	0		0.023	0		0.023	0		0.053	1	
C4 (0-1) 021318	C4	SO-01	<LOAELPRGS>	59.1	1		96.5	1		10.2	0		4.1	1		0.19	1		0.46	1		2.1	1		0.5	1	
C7 (0-1) 021318	C7	SO-03	<LOAELPRGS>	166	1		158	1		17	1		0.054	1		0.015	1		0.024	0		0.024	0		0.074	1	
C9 (0-1) 021418	C9	SO-03	<LOAELPRGS>	301	1		359	1		24.6	1		4.1	1		0.31	1		0.23	1		0.36	1		0.82	1	
D1 (0-1) 021318	D1	SO-01	<LOAELPRGS>	551	1		492	1		23	1		2.4	1		0.22	1		0.23	0		0.23	0		0.38	1	
D10 (0-1) 020918	D10	SO-05	<LOAELPRGS>	219	1		143	1		12.7	1		8.6	1		0.25	0		0.5	0		0.5	0		2.8	1	
D11 (0-1) 020918	D11	SO-05	<LOAELPRGS>	70.3	1		8	0		0.78	1		0.041	1		0.042	0		0.081	1		0.83	1	
D12 (0-1) 020918	D12	SO-05	<LOAELPRGS>	1720	1		1530	1		125	1		2.7	1		0.22	0		0.44	0		0.44	0		1.2	1	
D13 (0-1) 020918	D13	SO-05	<LOAELPRGS>	1110	1		971	1		64.8	1		2.6	1		0.1	0		0.22	1		0.47	1		1.2	1	
D14 (0-1) 020918	D14	SO-07	<LOAELPRGS>	990	1		1110	1		65.3	1		4.6	1		0.13	1		0.39	1		1.3	1		1.8	1	
D15 (0-1) 020818	D15	SO-07	<LOAELPRGS>	328	1		269	1		35.5	1		1.1	1		0.044	0		0.088	0		0.088	0		0.28	1	
D16 (0-1) 020818	D16	SO-07	<LOAELPRGS>	793	1		767	1		61	1		1.4	1		0.23	0		0.45	0		0.45	0		0.45	0	
D19 (0-1) 020818	D19	SO-09	<LOAELPRGS>	59.7	1		220	1		41.9	1		14	1		2.2	0		4.4	0		4.4	0		4.4	0	
D2 (0-1) 021318	D2	SO-01	<LOAELPRGS>	299	1		491	1		29.9	1		1.5	1		0.051	1		0.094	0		0.098	1		0.58	1	
D21 (0-1) 020818	D21	SO-09	<LOAELPRGS>	503	1		521	1		90.5	1		9.5	1		0.93	1		0.69	1		1.3	1		1	1	
D23 (0-1) 020818	D23	SO-12	<LOAELPRGS>	180	1		901	1		9.97	0		0.046	0		0.023	0		0.046	0		0.046	0		0.046	0	
D24 (0-1) 020818	D24	SO-12	<LOAELPRGS>	708	1		358	1		106	1		0.012	1		0.0052	0		0.01	0		0.01	0		0.01	0	
D25 (0-1) 020818	D25	SO-12	<LOAELPRGS>	131	1		415	1		9.55	0		0.044	0		0.022	0		0.044	0		0.044	0		0.044	0	
D27 (0-1) 020618	D27	SO-15	<LOAELPRGS>	3740	1		186	1		135	1		0.059	1		0.021	0		0.042	0		0.042	0		0.12	1	
D29 (0-1) 020618	D29	SO-15	<LOAELPRGS>	51.4	1		144	1		11.6	0		0.0046	0		0.0023	0		0.0046	0		0.0046	0		0.0046	0	
D3 (0-1) 021318	D3	SO-01	<LOAELPRGS>	361	1		162	1		39.5	1		0.35	1		0.49	1		0.21	0		0.21	0		0.21	0	
D30 (0-1) 020618	D30	SO-17	<LOAELPRGS>	270	1		122	1		13.4	1		0.065	1		0.011	0		0.022	0		0.022	0		0.086	1	
D31 (0-1) 020618	D31	SO-17	<LOAELPRGS>	156	1		554	1		7.27	0		0.48	0		0.24	0		0.48	0		0.48	0		0.48	0	
D32 (0-1) 020618	D32	SO-17	<LOAELPRGS>	222	1		533	1		7.48	0		0.47	0		0.24	0		0.47	0		0.47	0		0.47	0	
D33 (0-1) 020618	D33	SO-17	<LOAELPRGS>	210	1		192	1		12.9	1		8	1		0.22	0		0.47	1		0.43	0		0.7	1	
D34 (0-1) 020618	D34	SO-17	<LOAELPRGS>	84.7	1		63.6	1		27.2	1		0.014	1		0.0043	0		0.0085	0		0.0085	0		0.038	1	
D6 (0-1) 021318	D6	SO-03	<LOAELPRGS>	107	1		124	1		13.4	1		0.84	1		0.021	0		0.11	1		0.05	1		0.13	1	
D7 (0-1) 021318	D7	SO-03	<LOAELPRGS>	737	1		403	1		74.4	1		1.5	1		0.61	1		0.088	1		0.083	0		0.42	1	
D9 (0-1) 021318	D9	SO-03	<LOAELPRGS>	1820	1		1160	1		105	1		4.4	1		1.4	1		0.23	0		0.27	1		0.8	1	
E12 (0-1) 020918	E12	SO-06	<LOAELPRGS>	84.7	1		293	1		8.09	1		6.2	1		1.7	1		0.37	1		0.77	1		1.1	1	
E14 (0-1) 020918	E14	SO-08	<LOAELPRGS>	1060	1		933	1		122	1		6.14	1		0.025	1		0.043	0		0.043	0		0.12	1	
E16 (0-1) 020918	E16	SO-08	<LOAELPRGS>	295	1		255	1		23.3	1		5.5	1		0.12	0		0.48	1		0.24	0		0.96	1	
E17 (0-1) 020918	E17	SO-08	<LOAELPRGS>	922	1		751	1		11.6	1		2.8	1		0.21	0		0.41	0		0.53	1		0.62	1	
E18 (0-1) 020918	E18	SO-10x	<LOAELPRGS>	718	1		767	1		7.67	1		2	1		0.24	0		0.47	0		0.47	0		0.66	1	
E19 (0-1) 020918	E19	SO-10x	<LOAELPRGS>	388	1		363	1		11.2	1		0.87	1		0.21	0		0.42	0		0.42	0		0.67	1	
E2 (0-1) 021318	E2	SO-02	<LOAELPRGS>	1190	1		439	1		109	1		0.055	1		0.025	0		0.05	0		0.05	0		0.12	1	
E20 (0-1) 020918	E20	SO-10x	<LOAELPRGS>	92.7	1		141	1		7.42	0		0.22	0		0.11	0		0.22	0		0.22	0		0.22	0	
E21 (0-1) 020918	E21	SO-10x	<LOAELPRGS>	1540	1		733	1		15.1	1		0.68	1		0.11	0		0.22	0		0.22	0		0.49	1	
E22 (0-1) 020918	E22	SO-13	<LOAELPRGS>	857	1		951	1		79	1		11	1		0.78	1		0.94	1		1	1		0.54	1	
E23 (0-1) 020818	E23	SO-13	<LOAELPRGS>	1020	1		1000	1		16.9	1		0.51	1		0.24	0		0.48	0		0.48	0		0.48	0	
E24 (0-1) 020818	E24	SO-13	<LOAELPRGS>	911	1		605	1		56.7	1		3.1	1		0.24	0		0.73	1		0.49	0		1.6	1	
E26 (0-1) 020618	E26	SO-16	<LOAELPRGS>	495	1		93.9	1		119	1		0.62	1		0.022	0		0.057	1		0.045	0		0.19	1	
E28 (0-1) 020618	E28	SO-16	<LOAELPRGS>	1780	1		245	1		41.7	1		0.14	1		0.022	0		0.044	0		0.044	0		0.14	1	

Attachment D-1a
Post Corrective Action ProUCL Data Set for Surficial Soil by Shrew Exposure Unit

SID	LOC_ID	EA_SHREW	CA_GRP	Lead	D_Lead	Lead_R	D_Lead_R	Zinc	D_Zinc	Zinc_R	D_Zinc_R	Arsenic	D_Arsenic	Arsenic_R	D_Arsenic_R	4,4'-DDT	D_4,4'-DDT	4,4'-DDT_R	D_4,4'-DDT_R	beta-BHC	D_beta-BHC	beta-BHC_R	D_beta-BHC_R	4,4'-DDD	D_4,4'-DDD	4,4'-DDD_R	D_4,4'-DDD_R	Dieldrin	D_Dieldrin	Dieldrin_R	D_Dieldrin_R	4,4'-DDE	D_4,4'-DDE	4,4'-DDE_R	D_4,4'-DDE_R
E29 (0-1) 020618	E29	SO-16	<LOAELPRGS	566	1			242	1			23.8	1			1.1	1			0.26	0			0.51	0			0.51	0			1.3	1		
E30 (0-1) 020618	E30	SO-18	<LOAELPRGS	353	1			747	1			8.02	1			0.45	0			0.23	0			0.45	0			0.45	0			0.45	0		
E31 (0-1) 020618	E31	SO-18	<LOAELPRGS	102	1			198	1			8.09	1			0.16	1			0.024	0			0.047	0			0.047	0			0.07	1		
E32 (0-1) 020618	E32	SO-18	<LOAELPRGS	399	1			890	1			11.4	1			0.65	1			0.05	0			0.099	0			0.099	0			0.18	1		
E34 (0-1) 021418	E34	SO-18	<LOAELPRGS	67.3	1			46.1	1			7.47	0			0.0042	0			0.0021	0			0.0042	0			0.0042	0			0.0074	1		
E35 (0-1) 021418	E35	SO-18	<LOAELPRGS	33.7	1			33.9	1			7.5	0			0.0041	0			0.0021	0			0.0041	0			0.0041	0			0.0041	0		
E6 (0-1) 021318	E6	SO-04	<LOAELPRGS	1230	1			451	1			120	1			3.4	1			0.1	1			0.12	1			0.31	1			0.63	1		
E7 (0-1) 021318	E7	SO-04	<LOAELPRGS	1730	1			156	1			115	1			1.3	1			0.047	0			0.094	0			0.1	1			0.5	1		
F11 (0-1) 021318	F11	SO-06	<LOAELPRGS	344	1			194	1			39.1	1			4.8	1			0.047	1			0.12	1			0.48	1			0.35	1		
F12 (0-1) 021318	F12	SO-06	<LOAELPRGS	1350	1			583	1			37.1	1			7.9	1			1	1			2.5	1			1.5	1			2.4	1		
F14 (0-1) 021318	F14	SO-08	<LOAELPRGS	189	1			209	1			21.9	1			1.8	1			0.2	0			0.4	0			0.4	0			0.84	1		
F15 (0-1) 021318	F15	SO-08	<LOAELPRGS	93.4	1			154	1			9.38	1			1.3	1			0.044	0			0.088	0			0.1	1			0.55	1		
F16 (0-1) 021318	F16	SO-08	<LOAELPRGS	99.5	1			104	1			7.33	0			2.1	1			0.044	0			0.088	0			0.088	0			1.7	1		
F17 (0-1) 021318	F17	SO-08	<LOAELPRGS	132	1			301	1			7.8	1			0.62	1			0.11	0			0.22	0			0.22	0			0.33	1		
F18 (0-1) 021418	F18	SO-10x	<LOAELPRGS	45.2	1			140	1			7.48	0			0.048	0			0.024	0			0.048	0			0.048	0			0.048	0		
F19 (0-1) 021418	F19	SO-10x	<LOAELPRGS	37.1	1			106	1			7.43	0			0.3	1			0.042	0			0.084	0			0.084	0			0.084	0		
F20 (0-1) 021418	F20	SO-10x	<LOAELPRGS	80.2	1			139	1			7.43	0			0.055	1			0.02	0			0.041	0			0.041	0			0.041	0		
F21 (0-1) 021418	F21	SO-10x	<LOAELPRGS	146	1			351	1			18.8	1			0.087	0			0.044	0			0.087	0			0.087	0			0.087	0		
F22 (0-1) 021418	F22	SO-13	<LOAELPRGS	189	1			700	1			7.46	0			0.63	1			0.25	0			0.49	0			0.49	0			0.49	0		
F23 (0-1) 021418	F23	SO-13	<LOAELPRGS	183	1			609	1			8.38	1			0.76	1			0.11	0			0.22	0			0.22	0			0.22	0		
F24 (0-1) 021418	F24	SO-13	<LOAELPRGS	262	1			894	1			7.4	0			0.14	1			0.022	0			0.044	0			0.044	0			0.069	1		
F25 (0-1) 021418	F25	SO-13	<LOAELPRGS	2610	1			669	1			61.4	1			0.046	0			0.023	0			0.046	0			0.046	0			0.046	0		
F26 (0-1) 021418	F26	SO-16	<LOAELPRGS	5310	1			193	1			120	1			0.064	1			0.022	0			0.044	0			0.044	0			0.064	1		
F27 (0-1) 021418	F27	SO-16	<LOAELPRGS	327	1			364	1			16.8	1			0.042	0			0.021	0			0.042	0			0.042	0			0.042	0		
F28 (0-1) 021418	F28	SO-16	<LOAELPRGS	1890	1			780	1			60.1	1			0.045	0			0.023	0			0.045	0			0.045	0			0.045	0		
F30 (0-1) 021418	F30	SO-18	<LOAELPRGS	46.5	1			97	1			7.46	0			0.0046	0			0.0023	0			0.0046	0			0.0046	0			0.0046	0		
F32 (0-1) 021418	F32	SO-18	<LOAELPRGS	136	1			135	1			13.8	1			6.5	1			0.094	1			0.27	1			0.15	1			0.18	1		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 12:32:19 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	23	Minimum Non-Detect	10.2
Maximum Detect	51.2	Maximum Non-Detect	10.2
Variance Detects	149.8	Percent Non-Detects	20%
Mean Detects	35.9	SD Detects	12.24
Median Detects	34.7	CV Detects	0.341
Skewness Detects	0.46	Kurtosis Detects	-1.032
Mean of Logged Detects	3.536	SD of Logged Detects	0.346

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.188	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	30.76	KM Standard Error of Mean	7.222
KM SD	13.98	95% KM (BCA) UCL	N/A
95% KM (t) UCL	46.16	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	42.64	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	52.42	95% KM Chebyshev UCL	62.24
97.5% KM Chebyshev UCL	75.86	99% KM Chebyshev UCL	102.6

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.207	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

K-S Test Statistic	0.191	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.395	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)	11.43	k star (bias corrected MLE)	3.024
Theta hat (MLE)	3.141	Theta star (bias corrected MLE)	11.87
nu hat (MLE)	91.43	nu star (bias corrected)	24.19
Mean (detects)	35.9		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	7.301	Mean	30.18
Maximum	51.2	Median	29.9
SD	16.61	CV	0.55
k hat (MLE)	2.926	k star (bias corrected MLE)	1.304
Theta hat (MLE)	10.31	Theta star (bias corrected MLE)	23.15
nu hat (MLE)	29.26	nu star (bias corrected)	13.04
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (13.04, α)	5.918	Adjusted Chi Square Value (13.04, β)	4.003
95% Gamma Approximate UCL (use when n>=50)	66.49	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	30.76	SD (KM)	13.98
Variance (KM)	195.6	SE of Mean (KM)	7.222
k hat (KM)	4.838	k star (KM)	2.069
nu hat (KM)	48.38	nu star (KM)	20.69
theta hat (KM)	6.358	theta star (KM)	14.87
80% gamma percentile (KM)	45.87	90% gamma percentile (KM)	59.35
95% gamma percentile (KM)	72.19	99% gamma percentile (KM)	100.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.69, α)	11.36	Adjusted Chi Square Value (20.69, β)	8.5
95% Gamma Approximate KM-UCL (use when n>=50)	56.02	95% Gamma Adjusted KM-UCL (use when n<50)	74.86

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.992	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.157	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean in Original Scale	31.41	Mean in Log Scale	3.349
SD in Original Scale	14.59	SD in Log Scale	0.515
95% t UCL (assumes normality of ROS data)	45.33	95% Percentile Bootstrap UCL	41.3
95% BCA Bootstrap UCL	41.31	95% Bootstrap t UCL	48.19
95% H-UCL (Log ROS)	70.24		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.294	KM Geo Mean	26.94
KM SD (logged)	0.555	95% Critical H Value (KM-Log)	3.127
KM Standard Error of Mean (logged)	0.286	95% H-UCL (KM -Log)	74.78
KM SD (logged)	0.555	95% Critical H Value (KM-Log)	3.127
KM Standard Error of Mean (logged)	0.286		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	29.74	Mean in Log Scale	3.155
SD in Original Scale	17.38	SD in Log Scale	0.904
95% t UCL (Assumes normality)	46.31	95% H-Stat UCL	269.1

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 46.16

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.

Arsenic (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Minimum	109	Mean	109
Maximum	109	Median	109

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Arsenic (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Arsenic (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	13.4	Mean	46.88
Maximum	105	Median	24.6
SD	40.76	Std. Error of Mean	18.23
Coefficient of Variation	0.869	Skewness	0.873

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.84	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.308	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	85.74	95% Adjusted-CLT UCL (Chen-1995)	84.47
		95% Modified-t UCL (Johnson-1978)	86.93

Gamma GOF Test

A-D Test Statistic	0.438	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.686	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.285	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.361	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.669	k star (bias corrected MLE)	0.801
Theta hat (MLE)	28.1	Theta star (bias corrected MLE)	58.55
nu hat (MLE)	16.69	nu star (bias corrected)	8.007
MLE Mean (bias corrected)	46.88	MLE Sd (bias corrected)	52.39
		Approximate Chi Square Value (0.05)	2.739
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	1.584

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	137	95% Adjusted Gamma UCL (use when n<50)	237

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.891	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.235	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.595	Mean of logged Data	3.519
Maximum of Logged Data	4.654	SD of logged Data	0.913

Assuming Lognormal Distribution

95% H-UCL	406.1	90% Chebyshev (MVUE) UCL	101.2
95% Chebyshev (MVUE) UCL	126	97.5% Chebyshev (MVUE) UCL	160.5
99% Chebyshev (MVUE) UCL	228.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	76.86	95% Jackknife UCL	85.74
95% Standard Bootstrap UCL	73.92	95% Bootstrap-t UCL	269.8
95% Hall's Bootstrap UCL	428.8	95% Percentile Bootstrap UCL	74.44
95% BCA Bootstrap UCL	76.68		
90% Chebyshev(Mean, Sd) UCL	101.6	95% Chebyshev(Mean, Sd) UCL	126.3
97.5% Chebyshev(Mean, Sd) UCL	160.7	99% Chebyshev(Mean, Sd) UCL	228.2

Suggested UCL to Use

95% Student's-t UCL 85.74

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.

Arsenic (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Minimum	115	Mean	117.5
Maximum	120	Median	117.5

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Arsenic (so-04) was not processed!

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Arsenic (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	6	Number of Non-Detects	5
Number of Distinct Detects	6	Number of Distinct Non-Detects	4
Minimum Detect	11.3	Minimum Non-Detect	7.43
Maximum Detect	125	Maximum Non-Detect	8
Variance Detects	2027	Percent Non-Detects	45.45%
Mean Detects	42.55	SD Detects	45.03
Median Detects	20.75	CV Detects	1.058
Skewness Detects	1.617	Kurtosis Detects	2.05
Mean of Logged Detects	3.334	SD of Logged Detects	0.964

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.77	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.324	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	26.59	KM Standard Error of Mean	11.57
KM SD	35.03	95% KM (BCA) UCL	45.82
95% KM (t) UCL	47.56	95% KM (Percentile Bootstrap) UCL	45.41
95% KM (z) UCL	45.62	95% KM Bootstrap t UCL	105.6
90% KM Chebyshev UCL	61.3	95% KM Chebyshev UCL	77.02
97.5% KM Chebyshev UCL	98.85	99% KM Chebyshev UCL	141.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.505	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.281	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.339	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)	1.341	k star (bias corrected MLE)	0.782
Theta hat (MLE)	31.73	Theta star (bias corrected MLE)	54.44
nu hat (MLE)	16.09	nu star (bias corrected)	9.379
Mean (detects)	42.55		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	23.21
Maximum	125	Median	11.3
SD	38.82	CV	1.672
k hat (MLE)	0.213	k star (bias corrected MLE)	0.216
Theta hat (MLE)	108.9	Theta star (bias corrected MLE)	107.7
nu hat (MLE)	4.688	nu star (bias corrected)	4.743
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (4.74, α)	1.035	Adjusted Chi Square Value (4.74, β)	0.785
95% Gamma Approximate UCL (use when n>=50)	106.4	95% Gamma Adjusted UCL (use when n<50)	140.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	26.59	SD (KM)	35.03
Variance (KM)	1227	SE of Mean (KM)	11.57
k hat (KM)	0.576	k star (KM)	0.479
nu hat (KM)	12.67	nu star (KM)	10.55
theta hat (KM)	46.16	theta star (KM)	55.45
80% gamma percentile (KM)	43.57	90% gamma percentile (KM)	72.55
95% gamma percentile (KM)	103.7	99% gamma percentile (KM)	180.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.55, α)	4.287	Adjusted Chi Square Value (10.55, β)	3.659
95% Gamma Approximate KM-UCL (use when n>=50)	65.41	95% Gamma Adjusted KM-UCL (use when n<50)	76.64

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	24.07	Mean in Log Scale	2.087
SD in Original Scale	38.27	SD in Log Scale	1.601
95% t UCL (assumes normality of ROS data)	44.98	95% Percentile Bootstrap UCL	44.15
95% BCA Bootstrap UCL	53.61	95% Bootstrap t UCL	103.4
95% H-UCL (Log ROS)	250.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.73	KM Geo Mean	15.33
KM SD (logged)	0.927	95% Critical H Value (KM-Log)	2.86
KM Standard Error of Mean (logged)	0.306	95% H-UCL (KM -Log)	54.52

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM SD (logged)	0.927	95% Critical H Value (KM-Log)	2.86
KM Standard Error of Mean (logged)	0.306		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	24.93	Mean in Log Scale	2.422
SD in Original Scale	37.73	SD in Log Scale	1.25
95% t UCL (Assumes normality)	45.55	95% H-Stat UCL	98.09

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 47.56

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	8.09	Mean	28.1
Maximum	39.1	Median	37.1
SD	17.36	Std. Error of Mean	10.02
Coefficient of Variation	0.618	Skewness	-1.706

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.798	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.365	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	57.35	95% Adjusted-CLT UCL (Chen-1995)	34.03
		95% Modified-t UCL (Johnson-1978)	55.71

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	2.51	k star (bias corrected MLE)	N/A
Theta hat (MLE)	11.19	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	15.06	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.775	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.375	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.091	Mean of logged Data	3.123
Maximum of Logged Data	3.666	SD of logged Data	0.895

Assuming Lognormal Distribution

95% H-UCL	54694	90% Chebyshev (MVUE) UCL	70.49
95% Chebyshev (MVUE) UCL	89.19	97.5% Chebyshev (MVUE) UCL	115.1
99% Chebyshev (MVUE) UCL	166.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	44.58	95% Jackknife UCL	57.35
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	58.16	95% Chebyshev(Mean, Sd) UCL	71.77
97.5% Chebyshev(Mean, Sd) UCL	90.67	99% Chebyshev(Mean, Sd) UCL	127.8

Suggested UCL to Use

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Student's-t UCL 57.35

Recommended UCL exceeds the maximum observation

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.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Arsenic (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	5	Number of Non-Detects	2
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	34.6	Minimum Non-Detect	7.39
Maximum Detect	65.3	Maximum Non-Detect	7.46
Variance Detects	212.3	Percent Non-Detects	28.57%
Mean Detects	47.52	SD Detects	14.57
Median Detects	41.2	CV Detects	0.307
Skewness Detects	0.529	Kurtosis Detects	-2.917
Mean of Logged Detects	3.824	SD of Logged Detects	0.301

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	36.05	KM Standard Error of Mean	8.964
KM SD	21.21	95% KM (BCA) UCL	49.03
95% KM (t) UCL	53.47	95% KM (Percentile Bootstrap) UCL	48.71
95% KM (z) UCL	50.8	95% KM Bootstrap t UCL	47.13
90% KM Chebyshev UCL	62.95	95% KM Chebyshev UCL	75.13
97.5% KM Chebyshev UCL	92.03	99% KM Chebyshev UCL	125.2

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.519	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.265	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.357	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)	13.75	k star (bias corrected MLE)	5.632
Theta hat (MLE)	3.457	Theta star (bias corrected MLE)	8.437
nu hat (MLE)	137.5	nu star (bias corrected)	56.32
Mean (detects)	47.52		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	15.01	Mean	38.23
Maximum	65.3	Median	35.5
SD	19.83	CV	0.519
k hat (MLE)	3.78	k star (bias corrected MLE)	2.255
Theta hat (MLE)	10.11	Theta star (bias corrected MLE)	16.95
nu hat (MLE)	52.92	nu star (bias corrected)	31.58
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (31.58, α)	19.74	Adjusted Chi Square Value (31.58, β)	16.97
95% Gamma Approximate UCL (use when n>=50)	61.17	95% Gamma Adjusted UCL (use when n<50)	71.13

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	36.05	SD (KM)	21.21
Variance (KM)	450	SE of Mean (KM)	8.964
k hat (KM)	2.889	k star (KM)	1.746
nu hat (KM)	40.44	nu star (KM)	24.44
theta hat (KM)	12.48	theta star (KM)	20.65
80% gamma percentile (KM)	54.84	90% gamma percentile (KM)	72.42
95% gamma percentile (KM)	89.33	99% gamma percentile (KM)	127.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (24.44, α)	14.19	Adjusted Chi Square Value (24.44, β)	11.9
95% Gamma Approximate KM-UCL (use when n>=50)	62.12	95% Gamma Adjusted KM-UCL (use when n<50)	74.09

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.237	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	40.03	Mean in Log Scale	3.606
SD in Original Scale	17.47	SD in Log Scale	0.447
95% t UCL (assumes normality of ROS data)	52.86	95% Percentile Bootstrap UCL	50.7
95% BCA Bootstrap UCL	50.89	95% Bootstrap t UCL	58.23
95% H-UCL (Log ROS)	62.51		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.303	KM Geo Mean	27.2
KM SD (logged)	0.855	95% Critical H Value (KM-Log)	3.299
KM Standard Error of Mean (logged)	0.361	95% H-UCL (KM -Log)	124
KM SD (logged)	0.855	95% Critical H Value (KM-Log)	3.299
KM Standard Error of Mean (logged)	0.361		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	35	Mean in Log Scale	3.106
SD in Original Scale	24.46	SD in Log Scale	1.25
95% t UCL (Assumes normality)	52.97	95% H-Stat UCL	468

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 53.47

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.

Arsenic (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	6	Number of Non-Detects	1
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	7.8	Minimum Non-Detect	7.33
Maximum Detect	122	Maximum Non-Detect	7.33
Variance Detects	1958	Percent Non-Detects	14.29%
Mean Detects	32.66	SD Detects	44.25
Median Detects	16.75	CV Detects	1.355
Skewness Detects	2.333	Kurtosis Detects	5.547

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean of Logged Detects	2.964	SD of Logged Detects	1.005

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.626	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.417	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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

KM Mean	29.04	KM Standard Error of Mean	15.91
KM SD	38.43	95% KM (BCA) UCL	59.18
95% KM (t) UCL	59.96	95% KM (Percentile Bootstrap) UCL	59.43
95% KM (z) UCL	55.22	95% KM Bootstrap t UCL	171.8
90% KM Chebyshev UCL	76.78	95% KM Chebyshev UCL	98.4
97.5% KM Chebyshev UCL	128.4	99% KM Chebyshev UCL	187.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.719	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.714	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.335	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.34	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.094	k star (bias corrected MLE)	0.658
Theta hat (MLE)	29.87	Theta star (bias corrected MLE)	49.65
nu hat (MLE)	13.12	nu star (bias corrected)	7.895
Mean (detects)	32.66		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	28
Maximum	122	Median	11.6
SD	42.23	CV	1.508
k hat (MLE)	0.446	k star (bias corrected MLE)	0.35
Theta hat (MLE)	62.77	Theta star (bias corrected MLE)	79.96
nu hat (MLE)	6.245	nu star (bias corrected)	4.902

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (4.90, α)	1.107	Adjusted Chi Square Value (4.90, β)	0.659
95% Gamma Approximate UCL (use when n>=50)	124	95% Gamma Adjusted UCL (use when n<50)	208.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	29.04	SD (KM)	38.43
Variance (KM)	1477	SE of Mean (KM)	15.91
k hat (KM)	0.571	k star (KM)	0.422
nu hat (KM)	7.996	nu star (KM)	5.903
theta hat (KM)	50.85	theta star (KM)	68.89
80% gamma percentile (KM)	47.14	90% gamma percentile (KM)	81.26
95% gamma percentile (KM)	118.5	99% gamma percentile (KM)	211.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.90, α)	1.59	Adjusted Chi Square Value (5.90, β)	1.009
95% Gamma Approximate KM-UCL (use when n>=50)	107.8	95% Gamma Adjusted KM-UCL (use when n<50)	169.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.26	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	28.24	Mean in Log Scale	2.618
SD in Original Scale	42.05	SD in Log Scale	1.296
95% t UCL (assumes normality of ROS data)	59.13	95% Percentile Bootstrap UCL	58.34
95% BCA Bootstrap UCL	74.2	95% Bootstrap t UCL	146.1
95% H-UCL (Log ROS)	355.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.825	KM Geo Mean	16.86
KM SD (logged)	0.915	95% Critical H Value (KM-Log)	3.461
KM Standard Error of Mean (logged)	0.379	95% H-UCL (KM -Log)	93.37
KM SD (logged)	0.915	95% Critical H Value (KM-Log)	3.461
KM Standard Error of Mean (logged)	0.379		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	28.52	Mean in Log Scale	2.726
SD in Original Scale	41.85	SD in Log Scale	1.113
95% t UCL (Assumes normality)	59.26	95% H-Stat UCL	176.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% KM Bootstrap t UCL 171.8 ı Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 169.8

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Arsenic (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	36.5	Minimum Non-Detect	7.4
Maximum Detect	90.5	Maximum Non-Detect	7.47
Variance Detects	884.5	Percent Non-Detects	40%
Mean Detects	56.3	SD Detects	29.74
Median Detects	41.9	CV Detects	0.528
Skewness Detects	1.668	Kurtosis Detects	N/A
Mean of Logged Detects	3.946	SD of Logged Detects	0.489

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.824	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.353	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	36.74	KM Standard Error of Mean	16.68
KM SD	30.46	95% KM (BCA) UCL	N/A
95% KM (t) UCL	72.3	95% KM (Percentile Bootstrap) UCL	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% KM (z) UCL	64.18	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	86.79	95% KM Chebyshev UCL	109.5
97.5% KM Chebyshev UCL	140.9	99% KM Chebyshev UCL	202.7

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	6.064	k star (bias corrected MLE)	N/A
Theta hat (MLE)	9.284	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	36.38	nu star (bias corrected)	N/A
Mean (detects)	56.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	33.78
Maximum	90.5	Median	36.5
SD	37.32	CV	1.105
k hat (MLE)	0.239	k star (bias corrected MLE)	0.229
Theta hat (MLE)	141.4	Theta star (bias corrected MLE)	147.6
nu hat (MLE)	2.389	nu star (bias corrected)	2.289
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.29, α)	0.197	Adjusted Chi Square Value (2.29, β)	0.0818
95% Gamma Approximate UCL (use when n>=50)	392	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	36.74	SD (KM)	30.46
Variance (KM)	927.7	SE of Mean (KM)	16.68
k hat (KM)	1.455	k star (KM)	0.715
nu hat (KM)	14.55	nu star (KM)	7.153
theta hat (KM)	25.25	theta star (KM)	51.36
80% gamma percentile (KM)	60.35	90% gamma percentile (KM)	91.75
95% gamma percentile (KM)	124.1	99% gamma percentile (KM)	201.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.15, α)	2.255	Adjusted Chi Square Value (7.15, β)	1.245
95% Gamma Approximate KM-UCL (use when n>=50)	116.5	95% Gamma Adjusted KM-UCL (use when n<50)	211.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.861	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.333	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	38.72	Mean in Log Scale	3.373
SD in Original Scale	31.97	SD in Log Scale	0.858
95% t UCL (assumes normality of ROS data)	69.19	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	266.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.168	KM Geo Mean	23.76
KM SD (logged)	1.002	95% Critical H Value (KM-Log)	4.912
KM Standard Error of Mean (logged)	0.549	95% H-UCL (KM -Log)	459.3
KM SD (logged)	1.002	95% Critical H Value (KM-Log)	4.912
KM Standard Error of Mean (logged)	0.549		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	35.27	Mean in Log Scale	2.893
SD in Original Scale	35.66	SD in Log Scale	1.483
95% t UCL (Assumes normality)	69.27	95% H-Stat UCL	10051

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 72.3

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.

Arsenic (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	7.67	Minimum Non-Detect	7.42
Maximum Detect	18.8	Maximum Non-Detect	7.48
Variance Detects	23.18	Percent Non-Detects	50%
Mean Detects	13.19	SD Detects	4.815
Median Detects	13.15	CV Detects	0.365
Skewness Detects	0.0414	Kurtosis Detects	-1.42
Mean of Logged Detects	2.525	SD of Logged Detects	0.389

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.991	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.16	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	10.31	KM Standard Error of Mean	1.684
KM SD	4.126	95% KM (BCA) UCL	N/A
95% KM (t) UCL	13.5	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	13.08	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	15.36	95% KM Chebyshev UCL	17.65
97.5% KM Chebyshev UCL	20.83	99% KM Chebyshev UCL	27.07

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.212	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.202	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.395	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)	9.388	k star (bias corrected MLE)	2.514
Theta hat (MLE)	1.405	Theta star (bias corrected MLE)	5.248
nu hat (MLE)	75.11	nu star (bias corrected)	20.11
Mean (detects)	13.19		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.891
Maximum	18.8	Median	4.882
SD	7.466	CV	1.083
k hat (MLE)	0.396	k star (bias corrected MLE)	0.331
Theta hat (MLE)	17.4	Theta star (bias corrected MLE)	20.82
nu hat (MLE)	6.338	nu star (bias corrected)	5.295
Adjusted Level of Significance (β)	0.0195		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Approximate Chi Square Value (5.29, α)	1.291	Adjusted Chi Square Value (5.29, β)	0.86
95% Gamma Approximate UCL (use when n>=50)	28.27	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.31	SD (KM)	4.126
Variance (KM)	17.02	SE of Mean (KM)	1.684
k hat (KM)	6.239	k star (KM)	3.983
nu hat (KM)	99.83	nu star (KM)	63.73
theta hat (KM)	1.652	theta star (KM)	2.588
80% gamma percentile (KM)	14.22	90% gamma percentile (KM)	17.23
95% gamma percentile (KM)	20	99% gamma percentile (KM)	25.92

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (63.73, α)	46.36	Adjusted Chi Square Value (63.73, β)	42.64
95% Gamma Approximate KM-UCL (use when n>=50)	14.17	95% Gamma Adjusted KM-UCL (use when n<50)	15.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	8.487	Mean in Log Scale	1.921
SD in Original Scale	5.954	SD in Log Scale	0.705
95% t UCL (assumes normality of ROS data)	12.48	95% Percentile Bootstrap UCL	12.11
95% BCA Bootstrap UCL	12.11	95% Bootstrap t UCL	14.44
95% H-UCL (Log ROS)	18.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.265	KM Geo Mean	9.629
KM SD (logged)	0.353	95% Critical H Value (KM-Log)	2.128
KM Standard Error of Mean (logged)	0.144	95% H-UCL (KM -Log)	13.61
KM SD (logged)	0.353	95% Critical H Value (KM-Log)	2.128
KM Standard Error of Mean (logged)	0.144		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	8.456	Mean in Log Scale	1.92
SD in Original Scale	5.964	SD in Log Scale	0.696
95% t UCL (Assumes normality)	12.45	95% H-Stat UCL	17.79

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

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 13.5

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.

Arsenic (so-11)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	11.3	Mean	32.05
Maximum	74.8	Median	16.2
SD	28.56	Std. Error of Mean	11.66
Coefficient of Variation	0.891	Skewness	1.022

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.35	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	55.54	95% Adjusted-CLT UCL (Chen-1995)	56.42
		95% Modified-t UCL (Johnson-1978)	56.35

Gamma GOF Test

A-D Test Statistic	0.739	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.706	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.321	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.712	k star (bias corrected MLE)	0.967
Theta hat (MLE)	18.72	Theta star (bias corrected MLE)	33.14
nu hat (MLE)	20.55	nu star (bias corrected)	11.61

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

MLE Mean (bias corrected)	32.05	MLE Sd (bias corrected)	32.59
		Approximate Chi Square Value (0.05)	4.969
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	3.525

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	74.86	95% Adjusted Gamma UCL (use when n<50)	105.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.803	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.276	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.425	Mean of logged Data	3.148
Maximum of Logged Data	4.315	SD of logged Data	0.851

Assuming Lognormal Distribution

95% H-UCL	132.9	90% Chebyshev (MVUE) UCL	63.21
95% Chebyshev (MVUE) UCL	77.76	97.5% Chebyshev (MVUE) UCL	97.94
99% Chebyshev (MVUE) UCL	137.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	51.23	95% Jackknife UCL	55.54
95% Standard Bootstrap UCL	49.61	95% Bootstrap-t UCL	204.4
95% Hall's Bootstrap UCL	281	95% Percentile Bootstrap UCL	51
95% BCA Bootstrap UCL	51.73		
90% Chebyshev(Mean, Sd) UCL	67.02	95% Chebyshev(Mean, Sd) UCL	82.87
97.5% Chebyshev(Mean, Sd) UCL	104.9	99% Chebyshev(Mean, Sd) UCL	148

Suggested UCL to Use

95% Adjusted Gamma UCL 105.5

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Arsenic (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	2	Number of Non-Detects	3
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	102	Minimum Non-Detect	9.55
Maximum Detect	106	Maximum Non-Detect	11.1
Variance Detects	8	Percent Non-Detects	60%
Mean Detects	104	SD Detects	2.828
Median Detects	104	CV Detects	0.0272
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	4.644	SD of Logged Detects	0.0272

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	47.33	KM Standard Error of Mean	29.28
KM SD	46.29	95% KM (BCA) UCL	N/A
95% KM (t) UCL	109.7	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	95.48	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	135.2	95% KM Chebyshev UCL	174.9
97.5% KM Chebyshev UCL	230.2	99% KM Chebyshev UCL	338.6

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2704	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0385	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	10815	nu star (bias corrected)	N/A
Mean (detects)	104		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	47.33	SD (KM)	46.29
Variance (KM)	2143	SE of Mean (KM)	29.28

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

k hat (KM)	1.046	k star (KM)	0.552
nu hat (KM)	10.46	nu star (KM)	5.515
theta hat (KM)	45.27	theta star (KM)	85.81
80% gamma percentile (KM)	77.97	90% gamma percentile (KM)	125.4
95% gamma percentile (KM)	175.5	99% gamma percentile (KM)	297.7

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0086
Approximate Chi Square Value (5.52, α)	1.397	Adjusted Chi Square Value (5.52, β)	0.683
95% Gamma Approximate KM-UCL (use when n>=50)	186.8	95% Gamma Adjusted KM-UCL (use when n<50)	382.3

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	97.51	Mean in Log Scale	4.578
SD in Original Scale	6.094	SD in Log Scale	0.0616
95% t UCL (assumes normality of ROS data)	103.3	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		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.212	KM Geo Mean	24.82
KM SD (logged)	1.17	95% Critical H Value (KM-Log)	5.645
KM Standard Error of Mean (logged)	0.74	95% H-UCL (KM -Log)	1336
KM SD (logged)	1.17	95% Critical H Value (KM-Log)	5.645
KM Standard Error of Mean (logged)	0.74		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	44.66	Mean in Log Scale	2.834
SD in Original Scale	54.19	SD in Log Scale	1.653
95% t UCL (Assumes normality)	96.32	95% H-Stat UCL	42468

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	109.7	KM H-UCL	1336
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Warning: Recommended UCL exceeds the maximum observation

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).

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Arsenic (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	5	Number of Non-Detects	2
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	8.38	Minimum Non-Detect	7.4
Maximum Detect	79	Maximum Non-Detect	7.46
Variance Detects	922.8	Percent Non-Detects	28.57%
Mean Detects	44.48	SD Detects	30.38
Median Detects	56.7	CV Detects	0.683
Skewness Detects	-0.3	Kurtosis Detects	-2.42
Mean of Logged Detects	3.496	SD of Logged Detects	0.97

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.256	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	33.88	KM Standard Error of Mean	12.01
KM SD	28.42	95% KM (BCA) UCL	51.01
95% KM (t) UCL	57.22	95% KM (Percentile Bootstrap) UCL	51.83
95% KM (z) UCL	53.64	95% KM Bootstrap t UCL	59.99
90% KM Chebyshev UCL	69.91	95% KM Chebyshev UCL	86.24
97.5% KM Chebyshev UCL	108.9	99% KM Chebyshev UCL	153.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.456	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.685	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.321	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.361	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)	1.819	k star (bias corrected MLE)	0.861
Theta hat (MLE)	24.45	Theta star (bias corrected MLE)	51.66

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

nu hat (MLE)	18.19	nu star (bias corrected)	8.609
Mean (detects)	44.48		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	31.77
Maximum	79	Median	16.9
SD	32.95	CV	1.037
k hat (MLE)	0.302	k star (bias corrected MLE)	0.268
Theta hat (MLE)	105.1	Theta star (bias corrected MLE)	118.5
nu hat (MLE)	4.233	nu star (bias corrected)	3.752
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (3.75, α)	0.626	Adjusted Chi Square Value (3.75, β)	0.339
95% Gamma Approximate UCL (use when n>=50)	190.3	95% Gamma Adjusted UCL (use when n<50)	351.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	33.88	SD (KM)	28.42
Variance (KM)	807.8	SE of Mean (KM)	12.01
k hat (KM)	1.421	k star (KM)	0.907
nu hat (KM)	19.9	nu star (KM)	12.7
theta hat (KM)	23.84	theta star (KM)	37.34
80% gamma percentile (KM)	54.94	90% gamma percentile (KM)	79.91
95% gamma percentile (KM)	105.1	99% gamma percentile (KM)	163.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.70, α)	5.693	Adjusted Chi Square Value (12.70, β)	4.359
95% Gamma Approximate KM-UCL (use when n>=50)	75.6	95% Gamma Adjusted KM-UCL (use when n<50)	98.73

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.862	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	32.66	Mean in Log Scale	2.821
SD in Original Scale	31.98	SD in Log Scale	1.399
95% t UCL (assumes normality of ROS data)	56.14	95% Percentile Bootstrap UCL	51.83
95% BCA Bootstrap UCL	52.37	95% Bootstrap t UCL	61.91
95% H-UCL (Log ROS)	721.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM Mean (logged)	3.069	KM Geo Mean	21.51
KM SD (logged)	0.997	95% Critical H Value (KM-Log)	3.689
KM Standard Error of Mean (logged)	0.421	95% H-UCL (KM -Log)	158.7
KM SD (logged)	0.997	95% Critical H Value (KM-Log)	3.689
KM Standard Error of Mean (logged)	0.421		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	32.83	Mean in Log Scale	2.872
SD in Original Scale	31.79	SD in Log Scale	1.328
95% t UCL (Assumes normality)	56.18	95% H-Stat UCL	532.7

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	57.22

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.

Arsenic (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	8.03	Minimum Non-Detect	7.4
Maximum Detect	65.9	Maximum Non-Detect	7.4
Variance Detects	691.3	Percent Non-Detects	20%
Mean Detects	28.61	SD Detects	26.29
Median Detects	20.25	CV Detects	0.919
Skewness Detects	1.429	Kurtosis Detects	1.709
Mean of Logged Detects	3.032	SD of Logged Detects	0.928

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.865	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.259	**Lilliefors GOF Test**	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Lilliefors Critical Value	0.375	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

KM Mean	24.37	KM Standard Error of Mean	11.39
KM SD	22.06	95% KM (BCA) UCL	N/A
95% KM (t) UCL	48.65	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	43.11	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	58.55	95% KM Chebyshev UCL	74.03
97.5% KM Chebyshev UCL	95.52	99% KM Chebyshev UCL	137.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.282	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.399	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)	1.704	k star (bias corrected MLE)	0.593
Theta hat (MLE)	16.79	Theta star (bias corrected MLE)	48.28
nu hat (MLE)	13.63	nu star (bias corrected)	4.74
Mean (detects)	28.61		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	22.89
Maximum	65.9	Median	12.5
SD	26.12	CV	1.141
k hat (MLE)	0.404	k star (bias corrected MLE)	0.295
Theta hat (MLE)	56.64	Theta star (bias corrected MLE)	77.59
nu hat (MLE)	4.041	nu star (bias corrected)	2.95
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.95, α)	0.358	Adjusted Chi Square Value (2.95, β)	0.134
95% Gamma Approximate UCL (use when n>=50)	188.8	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	24.37	SD (KM)	22.06
Variance (KM)	486.8	SE of Mean (KM)	11.39
k hat (KM)	1.22	k star (KM)	0.621
nu hat (KM)	12.2	nu star (KM)	6.212
theta hat (KM)	19.98	theta star (KM)	39.22
80% gamma percentile (KM)	40.15	90% gamma percentile (KM)	62.88

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% gamma percentile (KM)	86.59	99% gamma percentile (KM)	143.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.21, α)	1.749	Adjusted Chi Square Value (6.21, β)	0.906
95% Gamma Approximate KM-UCL (use when n>=50)	86.53	95% Gamma Adjusted KM-UCL (use when n<50)	167

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	23.23	Mean in Log Scale	2.531
SD in Original Scale	25.76	SD in Log Scale	1.378
95% t UCL (assumes normality of ROS data)	47.78	95% Percentile Bootstrap UCL	41.49
95% BCA Bootstrap UCL	44.54	95% Bootstrap t UCL	108.4
95% H-UCL (Log ROS)	3018		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.826	KM Geo Mean	16.88
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	4.18
KM Standard Error of Mean (logged)	0.428	95% H-UCL (KM -Log)	134.5
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	4.18
KM Standard Error of Mean (logged)	0.428		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	23.63	Mean in Log Scale	2.688
SD in Original Scale	25.35	SD in Log Scale	1.114
95% t UCL (Assumes normality)	47.79	95% H-Stat UCL	552

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 48.65

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.

Arsenic (so-15)

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Number of Detects	1	Number of Non-Detects	2
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

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 Arsenic (so-15) was not processed!

Arsenic (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	16.8	Mean	63.57
Maximum	120	Median	50.9
SD	45.86	Std. Error of Mean	18.72
Coefficient of Variation	0.721	Skewness	0.542

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.22	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	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	101.3	95% Adjusted-CLT UCL (Chen-1995)	98.79
		95% Modified-t UCL (Johnson-1978)	102

Gamma GOF Test

A-D Test Statistic	0.34	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.704	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.225	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	2.114	k star (bias corrected MLE)	1.168
Theta hat (MLE)	30.06	Theta star (bias corrected MLE)	54.41
nu hat (MLE)	25.37	nu star (bias corrected)	14.02
MLE Mean (bias corrected)	63.57	MLE Sd (bias corrected)	58.81
		Approximate Chi Square Value (0.05)	6.585
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	4.864

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	135.3	95% Adjusted Gamma UCL (use when n<50)	183.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.194	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.821	Mean of logged Data	3.897
Maximum of Logged Data	4.787	SD of logged Data	0.815

Assuming Lognormal Distribution

95% H-UCL	248.2	90% Chebyshev (MVUE) UCL	128.1
95% Chebyshev (MVUE) UCL	156.9	97.5% Chebyshev (MVUE) UCL	197
99% Chebyshev (MVUE) UCL	275.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	94.36	95% Jackknife UCL	101.3
95% Standard Bootstrap UCL	91.31	95% Bootstrap-t UCL	139.9
95% Hall's Bootstrap UCL	137.9	95% Percentile Bootstrap UCL	92.65
95% BCA Bootstrap UCL	93.4		
90% Chebyshev(Mean, Sd) UCL	119.7	95% Chebyshev(Mean, Sd) UCL	145.2
97.5% Chebyshev(Mean, Sd) UCL	180.5	99% Chebyshev(Mean, Sd) UCL	249.9

Suggested UCL to Use

95% Student's-t UCL	101.3

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.

Arsenic (so-17)

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	12.9	Minimum Non-Detect	7.14
Maximum Detect	68.5	Maximum Non-Detect	7.48
Variance Detects	518	Percent Non-Detects	37.5%
Mean Detects	29.64	SD Detects	22.76
Median Detects	26.2	CV Detects	0.768
Skewness Detects	1.755	Kurtosis Detects	3.316
Mean of Logged Detects	3.19	SD of Logged Detects	0.68

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.783	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.343	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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

KM Mean	21.2	KM Standard Error of Mean	7.681
KM SD	19.43	95% KM (BCA) UCL	33.38
95% KM (t) UCL	35.76	95% KM (Percentile Bootstrap) UCL	33.97
95% KM (z) UCL	33.84	95% KM Bootstrap t UCL	48.19
90% KM Chebyshev UCL	44.25	95% KM Chebyshev UCL	54.69
97.5% KM Chebyshev UCL	69.17	99% KM Chebyshev UCL	97.63

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.453	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.272	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.36	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)	2.662	k star (bias corrected MLE)	1.198
Theta hat (MLE)	11.14	Theta star (bias corrected MLE)	24.74
nu hat (MLE)	26.62	nu star (bias corrected)	11.98
Mean (detects)	29.64		

Gamma ROS Statistics using Imputed Non-Detects

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	18.53
Maximum	68.5	Median	13.15
SD	23.05	CV	1.244
k hat (MLE)	0.265	k star (bias corrected MLE)	0.249
Theta hat (MLE)	69.86	Theta star (bias corrected MLE)	74.39
nu hat (MLE)	4.243	nu star (bias corrected)	3.985
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.99, α)	0.716	Adjusted Chi Square Value (3.99, β)	0.438
95% Gamma Approximate UCL (use when n>=50)	103.1	95% Gamma Adjusted UCL (use when n<50)	168.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	21.2	SD (KM)	19.43
Variance (KM)	377.6	SE of Mean (KM)	7.681
k hat (KM)	1.19	k star (KM)	0.827
nu hat (KM)	19.05	nu star (KM)	13.24
theta hat (KM)	17.81	theta star (KM)	25.63
80% gamma percentile (KM)	34.58	90% gamma percentile (KM)	51.14
95% gamma percentile (KM)	67.95	99% gamma percentile (KM)	107.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.24, α)	6.053	Adjusted Chi Square Value (13.24, β)	4.88
95% Gamma Approximate KM-UCL (use when n>=50)	46.37	95% Gamma Adjusted KM-UCL (use when n<50)	57.52

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	19.99	Mean in Log Scale	2.505
SD in Original Scale	21.76	SD in Log Scale	1.076
95% t UCL (assumes normality of ROS data)	34.56	95% Percentile Bootstrap UCL	32.75
95% BCA Bootstrap UCL	36.14	95% Bootstrap t UCL	48.08
95% H-UCL (Log ROS)	94.9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.731	KM Geo Mean	15.34
KM SD (logged)	0.763	95% Critical H Value (KM-Log)	2.87
KM Standard Error of Mean (logged)	0.302	95% H-UCL (KM -Log)	46.96
KM SD (logged)	0.763	95% Critical H Value (KM-Log)	2.87

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM Standard Error of Mean (logged)	0.302

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	19.89	Mean in Log Scale	2.479
SD in Original Scale	21.84	SD in Log Scale	1.108
95% t UCL (Assumes normality)	34.52	95% H-Stat UCL	103.4

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	35.76

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.

Arsenic (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	4	Number of Non-Detects	3
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	8.02	Minimum Non-Detect	7.46
Maximum Detect	13.8	Maximum Non-Detect	7.5
Variance Detects	7.846	Percent Non-Detects	42.86%
Mean Detects	10.33	SD Detects	2.801
Median Detects	9.745	CV Detects	0.271
Skewness Detects	0.595	Kurtosis Detects	-2.664
Mean of Logged Detects	2.308	SD of Logged Detects	0.267

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.871	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9.099	KM Standard Error of Mean	1.012
KM SD	2.319	95% KM (BCA) UCL	N/A
95% KM (t) UCL	11.07	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	10.76	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	12.13	95% KM Chebyshev UCL	13.51
97.5% KM Chebyshev UCL	15.42	99% KM Chebyshev UCL	19.17

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.434	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.325	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.394	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	18.62	k star (bias corrected MLE)	4.821
Theta hat (MLE)	0.555	Theta star (bias corrected MLE)	2.142
nu hat (MLE)	148.9	nu star (bias corrected)	38.57
Mean (detects)	10.33		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.024	Mean	7.197
Maximum	13.8	Median	8.02
SD	4.378	CV	0.608
k hat (MLE)	2.922	k star (bias corrected MLE)	1.765
Theta hat (MLE)	2.463	Theta star (bias corrected MLE)	4.078
nu hat (MLE)	40.9	nu star (bias corrected)	24.71
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (24.71, α)	14.39	Adjusted Chi Square Value (24.71, β)	12.08
95% Gamma Approximate UCL (use when n>=50)	12.36	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.099	SD (KM)	2.319
Variance (KM)	5.376	SE of Mean (KM)	1.012
k hat (KM)	15.4	k star (KM)	8.894
nu hat (KM)	215.6	nu star (KM)	124.5
theta hat (KM)	0.591	theta star (KM)	1.023
80% gamma percentile (KM)	11.52	90% gamma percentile (KM)	13.16
95% gamma percentile (KM)	14.63	99% gamma percentile (KM)	17.65

Gamma Kaplan-Meier (KM) Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Approximate Chi Square Value (124.51, α)	99.74	Adjusted Chi Square Value (124.51, β)	93.05
95% Gamma Approximate KM-UCL (use when n>=50)	11.36	95% Gamma Adjusted KM-UCL (use when n<50)	12.17

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.292	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	7.9	Mean in Log Scale	1.979
SD in Original Scale	3.618	SD in Log Scale	0.452
95% t UCL (assumes normality of ROS data)	10.56	95% Percentile Bootstrap UCL	10.04
95% BCA Bootstrap UCL	10.05	95% Bootstrap t UCL	11.44
95% H-UCL (Log ROS)	12.39		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.18	KM Geo Mean	8.846
KM SD (logged)	0.229	95% Critical H Value (KM-Log)	2.044
KM Standard Error of Mean (logged)	0.0999	95% H-UCL (KM -Log)	10.99
KM SD (logged)	0.229	95% Critical H Value (KM-Log)	2.044
KM Standard Error of Mean (logged)	0.0999		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.504	Mean in Log Scale	1.884
SD in Original Scale	4.041	SD in Log Scale	0.561
95% t UCL (Assumes normality)	10.47	95% H-Stat UCL	13.94

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 11.07

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 Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 12:32:11 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Zinc (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	96.5	Mean	337.3
Maximum	492	Median	445
SD	192.3	Std. Error of Mean	85.99
Coefficient of Variation	0.57	Skewness	-0.631

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	520.6	95% Adjusted-CLT UCL (Chen-1995)	452.8
		95% Modified-t UCL (Johnson-1978)	516.6

Gamma GOF Test

A-D Test Statistic	0.638	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.352	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.774	k star (bias corrected MLE)	1.243
Theta hat (MLE)	121.6	Theta star (bias corrected MLE)	271.4
nu hat (MLE)	27.74	nu star (bias corrected)	12.43
MLE Mean (bias corrected)	337.3	MLE Sd (bias corrected)	302.5
		Approximate Chi Square Value (0.05)	5.511
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	3.68

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	760.7	95% Adjusted Gamma UCL (use when n<50)	1139

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.799	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.332	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.57	Mean of logged Data	5.63
Maximum of Logged Data	6.198	SD of logged Data	0.755

Assuming Lognormal Distribution

95% H-UCL	1605	90% Chebyshev (MVUE) UCL	691.4
95% Chebyshev (MVUE) UCL	847.3	97.5% Chebyshev (MVUE) UCL	1064
99% Chebyshev (MVUE) UCL	1489		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	478.7	95% Jackknife UCL	520.6
95% Standard Bootstrap UCL	459.7	95% Bootstrap-t UCL	504.2
95% Hall's Bootstrap UCL	404.5	95% Percentile Bootstrap UCL	472.8
95% BCA Bootstrap UCL	425.6		
90% Chebyshev(Mean, Sd) UCL	595.3	95% Chebyshev(Mean, Sd) UCL	712.1
97.5% Chebyshev(Mean, Sd) UCL	874.3	99% Chebyshev(Mean, Sd) UCL	1193

Suggested UCL to Use

95% Student's-t UCL 520.6

Recommended UCL exceeds the maximum observation

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.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Zinc (so-02)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Minimum	439	Mean	439
Maximum	439	Median	439

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Zinc (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Zinc (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	124	Mean	440.8
Maximum	1160	Median	359
SD	420	Std. Error of Mean	187.8
Coefficient of Variation	0.953	Skewness	1.782

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.336	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	841.3	95% Adjusted-CLT UCL (Chen-1995)	909.8
		95% Modified-t UCL (Johnson-1978)	866.2

Gamma GOF Test

A-D Test Statistic	0.356	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.686	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.242	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.361	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	1.689	k star (bias corrected MLE)	0.809
Theta hat (MLE)	261	Theta star (bias corrected MLE)	544.9
nu hat (MLE)	16.89	nu star (bias corrected)	8.09
MLE Mean (bias corrected)	440.8	MLE Sd (bias corrected)	490.1
		Approximate Chi Square Value (0.05)	2.787
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	1.618

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1279	95% Adjusted Gamma UCL (use when n<50)	2204

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.939	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.195	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.82	Mean of logged Data	5.764
Maximum of Logged Data	7.056	SD of logged Data	0.883

Assuming Lognormal Distribution

95% H-UCL	3299	90% Chebyshev (MVUE) UCL	921.7
95% Chebyshev (MVUE) UCL	1145	97.5% Chebyshev (MVUE) UCL	1455
99% Chebyshev (MVUE) UCL	2063		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	749.8	95% Jackknife UCL	841.3
95% Standard Bootstrap UCL	713.4	95% Bootstrap-t UCL	1325
95% Hall's Bootstrap UCL	2108	95% Percentile Bootstrap UCL	792.6
95% BCA Bootstrap UCL	808.2		
90% Chebyshev(Mean, Sd) UCL	1004	95% Chebyshev(Mean, Sd) UCL	1260
97.5% Chebyshev(Mean, Sd) UCL	1614	99% Chebyshev(Mean, Sd) UCL	2310

Suggested UCL to Use

95% Student's-t UCL 841.3

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Zinc (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Minimum	156	Mean	303.5
Maximum	451	Median	303.5

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Zinc (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Zinc (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	49.7	Mean	302.7
Maximum	1530	Median	91.8
SD	485.7	Std. Error of Mean	146.5
Coefficient of Variation	1.605	Skewness	2.195

Normal GOF Test

Shapiro Wilk Test Statistic	0.563	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.447	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	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	568.1	95% Adjusted-CLT UCL (Chen-1995)	647.2
		95% Modified-t UCL (Johnson-1978)	584.3

Gamma GOF Test

A-D Test Statistic	1.834	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.395	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.265	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	0.783	k star (bias corrected MLE)	0.63
Theta hat (MLE)	386.5	Theta star (bias corrected MLE)	480.3
nu hat (MLE)	17.23	nu star (bias corrected)	13.87
MLE Mean (bias corrected)	302.7	MLE Sd (bias corrected)	381.3
		Approximate Chi Square Value (0.05)	6.479
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	5.676

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	647.8	95% Adjusted Gamma UCL (use when n<50)	739.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.748	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.315	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.906	Mean of logged Data	4.953
Maximum of Logged Data	7.333	SD of logged Data	1.11

Assuming Lognormal Distribution

95% H-UCL	809.2	90% Chebyshev (MVUE) UCL	501
95% Chebyshev (MVUE) UCL	618.4	97.5% Chebyshev (MVUE) UCL	781.2
99% Chebyshev (MVUE) UCL	1101		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	543.6	95% Jackknife UCL	568.1
95% Standard Bootstrap UCL	534.8	95% Bootstrap-t UCL	3747
95% Hall's Bootstrap UCL	2349	95% Percentile Bootstrap UCL	564.5
95% BCA Bootstrap UCL	631.1		
90% Chebyshev(Mean, Sd) UCL	742.1	95% Chebyshev(Mean, Sd) UCL	941.1
97.5% Chebyshev(Mean, Sd) UCL	1217	99% Chebyshev(Mean, Sd) UCL	1760

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 941.1

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Zinc (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	194	Mean	356.7
Maximum	583	Median	293
SD	202.2	Std. Error of Mean	116.7
Coefficient of Variation	0.567	Skewness	1.277

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.29	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	697.5	95% Adjusted-CLT UCL (Chen-1995)	640.6
		95% Modified-t UCL (Johnson-1978)	711.8

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	4.935	k star (bias corrected MLE)	N/A
Theta hat (MLE)	72.28	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	29.61	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.979	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lognormal Statistics

Minimum of Logged Data	5.268	Mean of logged Data	5.772
Maximum of Logged Data	6.368	SD of logged Data	0.556

Assuming Lognormal Distribution

95% H-UCL	6413	90% Chebyshev (MVUE) UCL	684.6
95% Chebyshev (MVUE) UCL	833.8	97.5% Chebyshev (MVUE) UCL	1041
99% Chebyshev (MVUE) UCL	1448		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	548.7	95% Jackknife UCL	697.5
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	706.8	95% Chebyshev(Mean, Sd) UCL	865.4
97.5% Chebyshev(Mean, Sd) UCL	1086	99% Chebyshev(Mean, Sd) UCL	1518

Suggested UCL to Use

95% Student's-t UCL 697.5

Recommended UCL exceeds the maximum observation

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.

Zinc (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	65.6	Mean	374.5
Maximum	1110	Median	215
SD	404.6	Std. Error of Mean	152.9
Coefficient of Variation	1.08	Skewness	1.337

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Normal GOF Test

Shapiro Wilk Test Statistic	0.794	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.317	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	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	671.7	95% Adjusted-CLT UCL (Chen-1995)	708.6
		95% Modified-t UCL (Johnson-1978)	684.6

Gamma GOF Test

A-D Test Statistic	0.407	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.215	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.319	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.104	k star (bias corrected MLE)	0.726
Theta hat (MLE)	339.2	Theta star (bias corrected MLE)	515.7
nu hat (MLE)	15.46	nu star (bias corrected)	10.17
MLE Mean (bias corrected)	374.5	MLE Sd (bias corrected)	439.5
		Approximate Chi Square Value (0.05)	4.047
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	2.968

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	941	95% Adjusted Gamma UCL (use when n<50)	1283

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.153	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.184	Mean of logged Data	5.409
Maximum of Logged Data	7.012	SD of logged Data	1.11

Assuming Lognormal Distribution

95% H-UCL	2543	90% Chebyshev (MVUE) UCL	829.3
95% Chebyshev (MVUE) UCL	1039	97.5% Chebyshev (MVUE) UCL	1329
99% Chebyshev (MVUE) UCL	1900		

Nonparametric Distribution Free UCL Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	626.1	95% Jackknife UCL	671.7
95% Standard Bootstrap UCL	611.3	95% Bootstrap-t UCL	1414
95% Hall's Bootstrap UCL	2374	95% Percentile Bootstrap UCL	622.5
95% BCA Bootstrap UCL	671.5		
90% Chebyshev(Mean, Sd) UCL	833.3	95% Chebyshev(Mean, Sd) UCL	1041
97.5% Chebyshev(Mean, Sd) UCL	1330	99% Chebyshev(Mean, Sd) UCL	1896

Suggested UCL to Use

95% Adjusted Gamma UCL 1283

Recommended UCL exceeds the maximum observation

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.

Zinc (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	104	Mean	386.7
Maximum	933	Median	255
SD	321.8	Std. Error of Mean	121.6
Coefficient of Variation	0.832	Skewness	1.173

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.319	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	Data Not 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	623.1	95% Adjusted-CLT UCL (Chen-1995)	644.4
		95% Modified-t UCL (Johnson-1978)	632.1

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.429	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.249	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.315	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.925	k star (bias corrected MLE)	1.195
Theta hat (MLE)	200.9	Theta star (bias corrected MLE)	323.6
nu hat (MLE)	26.95	nu star (bias corrected)	16.73
MLE Mean (bias corrected)	386.7	MLE Sd (bias corrected)	353.7
		Approximate Chi Square Value (0.05)	8.481
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	6.785

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	762.9	95% Adjusted Gamma UCL (use when n<50)	953.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.199	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.644	Mean of logged Data	5.676
Maximum of Logged Data	6.838	SD of logged Data	0.801

Assuming Lognormal Distribution

95% H-UCL	1129	90% Chebyshev (MVUE) UCL	728.7
95% Chebyshev (MVUE) UCL	886.4	97.5% Chebyshev (MVUE) UCL	1105
99% Chebyshev (MVUE) UCL	1535		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	586.8	95% Jackknife UCL	623.1
95% Standard Bootstrap UCL	570.2	95% Bootstrap-t UCL	1187
95% Hall's Bootstrap UCL	2248	95% Percentile Bootstrap UCL	580.4
95% BCA Bootstrap UCL	627.4		
90% Chebyshev(Mean, Sd) UCL	751.6	95% Chebyshev(Mean, Sd) UCL	917
97.5% Chebyshev(Mean, Sd) UCL	1146	99% Chebyshev(Mean, Sd) UCL	1597

Suggested UCL to Use

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Student's-t UCL 623.1

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Zinc (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	32.7	Mean	196.8
Maximum	521	Median	166
SD	198	Std. Error of Mean	88.53
Coefficient of Variation	1.006	Skewness	1.401

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	385.5	95% Adjusted-CLT UCL (Chen-1995)	401.7
		95% Modified-t UCL (Johnson-1978)	394.8

Gamma GOF Test

A-D Test Statistic	0.285	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.235	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.194	k star (bias corrected MLE)	0.611

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Theta hat (MLE)	164.8	Theta star (bias corrected MLE)	322.1
nu hat (MLE)	11.94	nu star (bias corrected)	6.11
MLE Mean (bias corrected)	196.8	MLE Sd (bias corrected)	251.8
		Approximate Chi Square Value (0.05)	1.696
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.872

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	708.9	95% Adjusted Gamma UCL (use when n<50)	1379

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.211	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.487	Mean of logged Data	4.808
Maximum of Logged Data	6.256	SD of logged Data	1.152

Assuming Lognormal Distribution

95% H-UCL	5860	90% Chebyshev (MVUE) UCL	491.8
95% Chebyshev (MVUE) UCL	624	97.5% Chebyshev (MVUE) UCL	807.4
99% Chebyshev (MVUE) UCL	1168		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	342.4	95% Jackknife UCL	385.5
95% Standard Bootstrap UCL	326.6	95% Bootstrap-t UCL	499.1
95% Hall's Bootstrap UCL	973.2	95% Percentile Bootstrap UCL	329.6
95% BCA Bootstrap UCL	363.1		
90% Chebyshev(Mean, Sd) UCL	462.4	95% Chebyshev(Mean, Sd) UCL	582.7
97.5% Chebyshev(Mean, Sd) UCL	749.7	99% Chebyshev(Mean, Sd) UCL	1078

Suggested UCL to Use

95% Student's-t UCL 385.5

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.

Zinc (so-10x)

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	106	Mean	342.5
Maximum	767	Median	246
SD	270.5	Std. Error of Mean	95.63
Coefficient of Variation	0.79	Skewness	0.942

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.796	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.272	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	523.7	95% Adjusted-CLT UCL (Chen-1995)	533.8
		95% Modified-t UCL (Johnson-1978)	529

Gamma GOF Test

A-D Test Statistic	0.651	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.297	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.963	k star (bias corrected MLE)	1.31
Theta hat (MLE)	174.5	Theta star (bias corrected MLE)	261.4
nu hat (MLE)	31.4	nu star (bias corrected)	20.96
MLE Mean (bias corrected)	342.5	MLE Sd (bias corrected)	299.2
		Approximate Chi Square Value (0.05)	11.56
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	9.844

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	620.9	95% Adjusted Gamma UCL (use when n<50)	729.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.28	**Lilliefors Lognormal GOF Test**

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Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.663	Mean of logged Data	5.56
Maximum of Logged Data	6.642	SD of logged Data	0.793

Assuming Lognormal Distribution

95% H-UCL	858	90% Chebyshev (MVUE) UCL	630.4
95% Chebyshev (MVUE) UCL	762.1	97.5% Chebyshev (MVUE) UCL	944.9
99% Chebyshev (MVUE) UCL	1304		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	499.8	95% Jackknife UCL	523.7
95% Standard Bootstrap UCL	490.4	95% Bootstrap-t UCL	727.1
95% Hall's Bootstrap UCL	630.8	95% Percentile Bootstrap UCL	497.9
95% BCA Bootstrap UCL	507.6		
90% Chebyshev(Mean, Sd) UCL	629.4	95% Chebyshev(Mean, Sd) UCL	759.3
97.5% Chebyshev(Mean, Sd) UCL	939.7	99% Chebyshev(Mean, Sd) UCL	1294

Suggested UCL to Use

95% Student's-t UCL 523.7

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Zinc (so-11)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	134	Mean	313
Maximum	524	Median	284
SD	170.1	Std. Error of Mean	69.43
Coefficient of Variation	0.543	Skewness	0.368

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

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Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.877	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	452.9	95% Adjusted-CLT UCL (Chen-1995)	438.4
		95% Modified-t UCL (Johnson-1978)	454.7

Gamma GOF Test

A-D Test Statistic	0.369	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.215	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.334	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.828	k star (bias corrected MLE)	2.025
Theta hat (MLE)	81.76	Theta star (bias corrected MLE)	154.6
nu hat (MLE)	45.94	nu star (bias corrected)	24.3
MLE Mean (bias corrected)	313	MLE Sd (bias corrected)	219.9
		Approximate Chi Square Value (0.05)	14.08
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	11.37

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	540.3	95% Adjusted Gamma UCL (use when n<50)	669

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.895	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.19	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.898	Mean of logged Data	5.61
Maximum of Logged Data	6.261	SD of logged Data	0.587

Assuming Lognormal Distribution

95% H-UCL	686.8	90% Chebyshev (MVUE) UCL	539.8
95% Chebyshev (MVUE) UCL	641.9	97.5% Chebyshev (MVUE) UCL	783.6

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Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

99% Chebyshev (MVUE) UCL	1062

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	427.2	95% Jackknife UCL	452.9
95% Standard Bootstrap UCL	416.1	95% Bootstrap-t UCL	505.9
95% Hall's Bootstrap UCL	520.8	95% Percentile Bootstrap UCL	416.2
95% BCA Bootstrap UCL	422.2		
90% Chebyshev(Mean, Sd) UCL	521.3	95% Chebyshev(Mean, Sd) UCL	615.7
97.5% Chebyshev(Mean, Sd) UCL	746.6	99% Chebyshev(Mean, Sd) UCL	1004

Suggested UCL to Use

95% Student's-t UCL	452.9

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.

Zinc (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	358	Minimum Non-Detect	111
Maximum Detect	901	Maximum Non-Detect	111
Variance Detects	59366	Percent Non-Detects	20%
Mean Detects	558.3	SD Detects	243.7
Median Detects	487	CV Detects	0.436
Skewness Detects	1.35	Kurtosis Detects	1.472
Mean of Logged Detects	6.26	SD of Logged Detects	0.407

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	468.8	KM Standard Error of Mean	134.3
KM SD	260	95% KM (BCA) UCL	N/A
95% KM (t) UCL	755.1	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	689.7	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	871.7	95% KM Chebyshev UCL	1054
97.5% KM Chebyshev UCL	1307	99% KM Chebyshev UCL	1805

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.318	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.658	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.248	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.395	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)	7.833	k star (bias corrected MLE)	2.125
Theta hat (MLE)	71.27	Theta star (bias corrected MLE)	262.7
nu hat (MLE)	62.66	nu star (bias corrected)	17
Mean (detects)	558.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	22.37	Mean	451.1
Maximum	901	Median	415
SD	319.3	CV	0.708
k hat (MLE)	1.175	k star (bias corrected MLE)	0.603
Theta hat (MLE)	383.8	Theta star (bias corrected MLE)	747.6
nu hat (MLE)	11.75	nu star (bias corrected)	6.034
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (6.03, α)	1.657	Adjusted Chi Square Value (6.03, β)	0.847
95% Gamma Approximate UCL (use when n>=50)	1642	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	468.8	SD (KM)	260
Variance (KM)	67625	SE of Mean (KM)	134.3
k hat (KM)	3.25	k star (KM)	1.433
nu hat (KM)	32.5	nu star (KM)	14.33
theta hat (KM)	144.3	theta star (KM)	327.1
80% gamma percentile (KM)	728.9	90% gamma percentile (KM)	987.8
95% gamma percentile (KM)	1240	99% gamma percentile (KM)	1811

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.33, α)	6.8	Adjusted Chi Square Value (14.33, β)	4.71
95% Gamma Approximate KM-UCL (use when n>=50)	988.1	95% Gamma Adjusted KM-UCL (use when n<50)	1427

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.941	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	481.9	Mean in Log Scale	6.042
SD in Original Scale	271.4	SD in Log Scale	0.6
95% t UCL (assumes normality of ROS data)	740.7	95% Percentile Bootstrap UCL	667
95% BCA Bootstrap UCL	683.8	95% Bootstrap t UCL	925.8
95% H-UCL (Log ROS)	1353		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.95	KM Geo Mean	383.6
KM SD (logged)	0.696	95% Critical H Value (KM-Log)	3.645
KM Standard Error of Mean (logged)	0.359	95% H-UCL (KM -Log)	1736
KM SD (logged)	0.696	95% Critical H Value (KM-Log)	3.645
KM Standard Error of Mean (logged)	0.359		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	457.7	Mean in Log Scale	5.811
SD in Original Scale	308.3	SD in Log Scale	1.063
95% t UCL (Assumes normality)	751.7	95% H-Stat UCL	9228

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	755.1

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.

Zinc (so-13)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	605	Mean	775.4
Maximum	1000	Median	700
SD	167.9	Std. Error of Mean	63.45
Coefficient of Variation	0.216	Skewness	0.356

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.245	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	898.7	95% Adjusted-CLT UCL (Chen-1995)	888.9
		95% Modified-t UCL (Johnson-1978)	900.1

Gamma GOF Test

A-D Test Statistic	0.522	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.311	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	25.34	k star (bias corrected MLE)	14.58
Theta hat (MLE)	30.6	Theta star (bias corrected MLE)	53.2
nu hat (MLE)	354.8	nu star (bias corrected)	204.1
MLE Mean (bias corrected)	775.4	MLE Sd (bias corrected)	203.1
		Approximate Chi Square Value (0.05)	172
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	163.1

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	919.9	95% Adjusted Gamma UCL (use when n<50)	970.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.221	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.405	Mean of logged Data	6.634
Maximum of Logged Data	6.908	SD of logged Data	0.215

Assuming Lognormal Distribution

95% H-UCL	928.2	90% Chebyshev (MVUE) UCL	964.1
95% Chebyshev (MVUE) UCL	1050	97.5% Chebyshev (MVUE) UCL	1168
99% Chebyshev (MVUE) UCL	1401		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	879.8	95% Jackknife UCL	898.7
95% Standard Bootstrap UCL	870.8	95% Bootstrap-t UCL	912.4
95% Hall's Bootstrap UCL	850.7	95% Percentile Bootstrap UCL	874.7
95% BCA Bootstrap UCL	879.1		
90% Chebyshev(Mean, Sd) UCL	965.8	95% Chebyshev(Mean, Sd) UCL	1052
97.5% Chebyshev(Mean, Sd) UCL	1172	99% Chebyshev(Mean, Sd) UCL	1407

Suggested UCL to Use

95% Student's-t UCL 898.7

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.

Zinc (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	101	Mean	286.8
Maximum	677	Median	173
SD	231.6	Std. Error of Mean	103.6
Coefficient of Variation	0.808	Skewness	1.672

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Shapiro Wilk Test Statistic	0.815	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	507.6	95% Adjusted-CLT UCL (Chen-1995)	539.9
		95% Modified-t UCL (Johnson-1978)	520.6

Gamma GOF Test

A-D Test Statistic	0.37	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.288	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.363	k star (bias corrected MLE)	1.079
Theta hat (MLE)	121.4	Theta star (bias corrected MLE)	265.9
nu hat (MLE)	23.63	nu star (bias corrected)	10.79
MLE Mean (bias corrected)	286.8	MLE Sd (bias corrected)	276.2
		Approximate Chi Square Value (0.05)	4.439
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	2.845

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	696.9	95% Adjusted Gamma UCL (use when n<50)	1087

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.249	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.615	Mean of logged Data	5.433
Maximum of Logged Data	6.518	SD of logged Data	0.728

Assuming Lognormal Distribution

95% H-UCL	1178	90% Chebyshev (MVUE) UCL	549.5
95% Chebyshev (MVUE) UCL	671.3	97.5% Chebyshev (MVUE) UCL	840.2
99% Chebyshev (MVUE) UCL	1172		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	457.2	95% Jackknife UCL	507.6
95% Standard Bootstrap UCL	437.1	95% Bootstrap-t UCL	1230
95% Hall's Bootstrap UCL	1645	95% Percentile Bootstrap UCL	460
95% BCA Bootstrap UCL	502.8		
90% Chebyshev(Mean, Sd) UCL	597.6	95% Chebyshev(Mean, Sd) UCL	738.4
97.5% Chebyshev(Mean, Sd) UCL	933.7	99% Chebyshev(Mean, Sd) UCL	1318

Suggested UCL to Use

95% Student's-t UCL 507.6

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.

Zinc (so-15)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	126	Mean	152
Maximum	186	Median	144
SD	30.79	Std. Error of Mean	17.78
Coefficient of Variation	0.203	Skewness	1.09

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.269	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	203.9	95% Adjusted-CLT UCL (Chen-1995)	193.2
		95% Modified-t UCL (Johnson-1978)	205.8

Gamma GOF Test

Not Enough Data to Perform GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	37.85	k star (bias corrected MLE)	N/A
Theta hat (MLE)	4.015	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	227.1	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.248	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.836	Mean of logged Data	5.011
Maximum of Logged Data	5.226	SD of logged Data	0.198

Assuming Lognormal Distribution

95% H-UCL	242.1	90% Chebyshev (MVUE) UCL	203.8
95% Chebyshev (MVUE) UCL	227.3	97.5% Chebyshev (MVUE) UCL	259.9
99% Chebyshev (MVUE) UCL	323.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	181.2	95% Jackknife UCL	203.9
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	205.3	95% Chebyshev(Mean, Sd) UCL	229.5
97.5% Chebyshev(Mean, Sd) UCL	263	99% Chebyshev(Mean, Sd) UCL	328.9

Suggested UCL to Use

95% Student's-t UCL 203.9

Recommended UCL exceeds the maximum observation

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).

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Zinc (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	93.9	Mean	319.7
Maximum	780	Median	243.5
SD	241.9	Std. Error of Mean	98.74
Coefficient of Variation	0.757	Skewness	1.765

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.819	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	518.6	95% Adjusted-CLT UCL (Chen-1995)	558.1
		95% Modified-t UCL (Johnson-1978)	530.5

Gamma GOF Test

A-D Test Statistic	0.327	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.703	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.335	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.551	k star (bias corrected MLE)	1.387
Theta hat (MLE)	125.3	Theta star (bias corrected MLE)	230.5
nu hat (MLE)	30.61	nu star (bias corrected)	16.64
MLE Mean (bias corrected)	319.7	MLE Sd (bias corrected)	271.5
		Approximate Chi Square Value (0.05)	8.415
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	6.417

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	632.1	95% Adjusted Gamma UCL (use when n<50)	828.8

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.199	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.542	Mean of logged Data	5.559
Maximum of Logged Data	6.659	SD of logged Data	0.701

Assuming Lognormal Distribution

95% H-UCL	896.7	90% Chebyshev (MVUE) UCL	586.9
95% Chebyshev (MVUE) UCL	709.4	97.5% Chebyshev (MVUE) UCL	879.4
99% Chebyshev (MVUE) UCL	1213		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	482.1	95% Jackknife UCL	518.6
95% Standard Bootstrap UCL	469.1	95% Bootstrap-t UCL	817.1
95% Hall's Bootstrap UCL	1407	95% Percentile Bootstrap UCL	478.7
95% BCA Bootstrap UCL	527		
90% Chebyshev(Mean, Sd) UCL	615.9	95% Chebyshev(Mean, Sd) UCL	750.1
97.5% Chebyshev(Mean, Sd) UCL	936.3	99% Chebyshev(Mean, Sd) UCL	1302

Suggested UCL to Use

95% Student's-t UCL 518.6

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.

Zinc (so-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	63.6	Mean	232
Maximum	554	Median	161.5
SD	198	Std. Error of Mean	70.01
Coefficient of Variation	0.853	Skewness	1.204

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.768	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.33	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	364.7	95% Adjusted-CLT UCL (Chen-1995)	379
		95% Modified-t UCL (Johnson-1978)	369.6

Gamma GOF Test

A-D Test Statistic	0.533	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.248	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.818	k star (bias corrected MLE)	1.219
Theta hat (MLE)	127.7	Theta star (bias corrected MLE)	190.3
nu hat (MLE)	29.08	nu star (bias corrected)	19.51
MLE Mean (bias corrected)	232	MLE Sd (bias corrected)	210.1
		Approximate Chi Square Value (0.05)	10.49
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	8.867

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	431.5	95% Adjusted Gamma UCL (use when n<50)	510.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.153	Mean of logged Data	5.147
Maximum of Logged Data	6.317	SD of logged Data	0.818

Assuming Lognormal Distribution

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% H-UCL	606	90% Chebyshev (MVUE) UCL	430.3
95% Chebyshev (MVUE) UCL	521.7	97.5% Chebyshev (MVUE) UCL	648.7
99% Chebyshev (MVUE) UCL	898		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	347.2	95% Jackknife UCL	364.7
95% Standard Bootstrap UCL	339.9	95% Bootstrap-t UCL	643.6
95% Hall's Bootstrap UCL	1261	95% Percentile Bootstrap UCL	339.6
95% BCA Bootstrap UCL	376.9		
90% Chebyshev(Mean, Sd) UCL	442.1	95% Chebyshev(Mean, Sd) UCL	537.2
97.5% Chebyshev(Mean, Sd) UCL	669.3	99% Chebyshev(Mean, Sd) UCL	928.6

Suggested UCL to Use

95% Adjusted Gamma UCL 510.5

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.

Zinc (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	2
Minimum	33.9	Mean	306.7
Maximum	890	Median	135
SD	356.3	Std. Error of Mean	134.7
Coefficient of Variation	1.162	Skewness	1.188

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.759	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.334	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	568.4	95% Adjusted-CLT UCL (Chen-1995)	592.8
		95% Modified-t UCL (Johnson-1978)	578.5

Gamma GOF Test

A-D Test Statistic	0.456	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.223	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.321	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.899	k star (bias corrected MLE)	0.609
Theta hat (MLE)	341.1	Theta star (bias corrected MLE)	503.6
nu hat (MLE)	12.59	nu star (bias corrected)	8.527
MLE Mean (bias corrected)	306.7	MLE Sd (bias corrected)	393
		Approximate Chi Square Value (0.05)	3.044
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	2.145

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	859.2	95% Adjusted Gamma UCL (use when n<50)	1219

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.523	Mean of logged Data	5.076
Maximum of Logged Data	6.791	SD of logged Data	1.265

Assuming Lognormal Distribution

95% H-UCL	3584	90% Chebyshev (MVUE) UCL	732.9
95% Chebyshev (MVUE) UCL	927.9	97.5% Chebyshev (MVUE) UCL	1199
99% Chebyshev (MVUE) UCL	1730		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	528.2	95% Jackknife UCL	568.4
95% Standard Bootstrap UCL	510.7	95% Bootstrap-t UCL	1484
95% Hall's Bootstrap UCL	2189	95% Percentile Bootstrap UCL	518.9
95% BCA Bootstrap UCL	585.9		
90% Chebyshev(Mean, Sd) UCL	710.7	95% Chebyshev(Mean, Sd) UCL	893.7

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

97.5% Chebyshev(Mean, Sd) UCL	1148	99% Chebyshev(Mean, Sd) UCL	1647

Suggested UCL to Use

95% Adjusted Gamma UCL 1219

Recommended UCL exceeds the maximum observation

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 Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 12:32:01 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	59.1	Mean	350.2
Maximum	551	Median	361
SD	190.3	Std. Error of Mean	85.12
Coefficient of Variation	0.543	Skewness	-0.875

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	531.7	95% Adjusted-CLT UCL (Chen-1995)	454.7

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Modified-t UCL (Johnson-1978)	526.1

Gamma GOF Test

A-D Test Statistic	0.495	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.294	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.353	k star (bias corrected MLE)	1.074
Theta hat (MLE)	148.9	Theta star (bias corrected MLE)	326
nu hat (MLE)	23.53	nu star (bias corrected)	10.74
MLE Mean (bias corrected)	350.2	MLE Sd (bias corrected)	337.9
		Approximate Chi Square Value (0.05)	4.412
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	2.825

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	852.9	95% Adjusted Gamma UCL (use when n<50)	1332

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.789	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.331	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.079	Mean of logged Data	5.631
Maximum of Logged Data	6.312	SD of logged Data	0.9

Assuming Lognormal Distribution

95% H-UCL	3137	90% Chebyshev (MVUE) UCL	823.1
95% Chebyshev (MVUE) UCL	1024	97.5% Chebyshev (MVUE) UCL	1303
99% Chebyshev (MVUE) UCL	1850		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	490.2	95% Jackknife UCL	531.7
95% Standard Bootstrap UCL	475.9	95% Bootstrap-t UCL	499.4
95% Hall's Bootstrap UCL	483.1	95% Percentile Bootstrap UCL	471
95% BCA Bootstrap UCL	448.6		
90% Chebyshev(Mean, Sd) UCL	605.6	95% Chebyshev(Mean, Sd) UCL	721.2
97.5% Chebyshev(Mean, Sd) UCL	881.8	99% Chebyshev(Mean, Sd) UCL	1197

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 531.7

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.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Lead (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Minimum	1190	Mean	1190
Maximum	1190	Median	1190

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Lead (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Lead (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	107	Mean	626.2
Maximum	1820	Median	301
SD	711.4	Std. Error of Mean	318.2
Coefficient of Variation	1.136	Skewness	1.656

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.805	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lilliefors Test Statistic	0.276	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	1304	95% Adjusted-CLT UCL (Chen-1995)	1401
		95% Modified-t UCL (Johnson-1978)	1344

Gamma GOF Test

A-D Test Statistic	0.306	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.69	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.236	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.364	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.099	k star (bias corrected MLE)	0.573
Theta hat (MLE)	569.7	Theta star (bias corrected MLE)	1093
nu hat (MLE)	10.99	nu star (bias corrected)	5.73
MLE Mean (bias corrected)	626.2	MLE Sd (bias corrected)	827.2
		Approximate Chi Square Value (0.05)	1.504
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.749

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2386	95% Adjusted Gamma UCL (use when n<50)	4791

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.673	Mean of logged Data	5.92
Maximum of Logged Data	7.507	SD of logged Data	1.144

Assuming Lognormal Distribution

95% H-UCL	16981	90% Chebyshev (MVUE) UCL	1481
95% Chebyshev (MVUE) UCL	1878	97.5% Chebyshev (MVUE) UCL	2430
99% Chebyshev (MVUE) UCL	3512		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% CLT UCL	1150	95% Jackknife UCL	1304
95% Standard Bootstrap UCL	1084	95% Bootstrap-t UCL	4003
95% Hall's Bootstrap UCL	4435	95% Percentile Bootstrap UCL	1170
95% BCA Bootstrap UCL	1273		
90% Chebyshev(Mean, Sd) UCL	1581	95% Chebyshev(Mean, Sd) UCL	2013
97.5% Chebyshev(Mean, Sd) UCL	2613	99% Chebyshev(Mean, Sd) UCL	3792

Suggested UCL to Use

95% Student's-t UCL 1304

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.

Lead (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Minimum	1230	Mean	1480
Maximum	1730	Median	1480

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Lead (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Lead (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	37.9	Mean	330
Maximum	1720	Median	69.2
SD	557.1	Std. Error of Mean	168
Coefficient of Variation	1.688	Skewness	2.126

Normal GOF Test

Shapiro Wilk Test Statistic	0.596	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.397	**Lilliefors GOF Test**	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Lilliefors Critical Value	0.251	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	634.5	95% Adjusted-CLT UCL (Chen-1995)	721.4
		95% Modified-t UCL (Johnson-1978)	652.4

Gamma GOF Test

A-D Test Statistic	1.35	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.772	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.332	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.267	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.617	k star (bias corrected MLE)	0.509
Theta hat (MLE)	534.9	Theta star (bias corrected MLE)	647.9
nu hat (MLE)	13.57	nu star (bias corrected)	11.21
MLE Mean (bias corrected)	330	MLE Sd (bias corrected)	462.4
		Approximate Chi Square Value (0.05)	4.708
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	4.044

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	785.4	95% Adjusted Gamma UCL (use when n<50)	914.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.811	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.295	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.635	Mean of logged Data	4.802
Maximum of Logged Data	7.45	SD of logged Data	1.346

Assuming Lognormal Distribution

95% H-UCL	1454	90% Chebyshev (MVUE) UCL	609.5
95% Chebyshev (MVUE) UCL	766.1	97.5% Chebyshev (MVUE) UCL	983.3
99% Chebyshev (MVUE) UCL	1410		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	606.3	95% Jackknife UCL	634.5

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Standard Bootstrap UCL	591.3	95% Bootstrap-t UCL	2441
95% Hall's Bootstrap UCL	2214	95% Percentile Bootstrap UCL	622
95% BCA Bootstrap UCL	691.8		
90% Chebyshev(Mean, Sd) UCL	833.9	95% Chebyshev(Mean, Sd) UCL	1062
97.5% Chebyshev(Mean, Sd) UCL	1379	99% Chebyshev(Mean, Sd) UCL	2001

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1062

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.

Lead (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	84.7	Mean	592.9
Maximum	1350	Median	344
SD	668.4	Std. Error of Mean	385.9
Coefficient of Variation	1.127	Skewness	1.443

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	1720	95% Adjusted-CLT UCL (Chen-1995)	1571
		95% Modified-t UCL (Johnson-1978)	1773

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1.034	k star (bias corrected MLE)	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Theta hat (MLE)	573.2	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.207	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	1	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.176	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.439	Mean of logged Data	5.829
Maximum of Logged Data	7.208	SD of logged Data	1.384

Assuming Lognormal Distribution

95% H-UCL	4.348E+10	90% Chebyshev (MVUE) UCL	1762
95% Chebyshev (MVUE) UCL	2290	97.5% Chebyshev (MVUE) UCL	3024
99% Chebyshev (MVUE) UCL	4466		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1228	95% Jackknife UCL	1720
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	1751	95% Chebyshev(Mean, Sd) UCL	2275
97.5% Chebyshev(Mean, Sd) UCL	3003	99% Chebyshev(Mean, Sd) UCL	4432

Suggested UCL to Use

95% Student's-t UCL 1720

Recommended UCL exceeds the maximum observation

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lead (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	35.4	Mean	363.7
Maximum	990	Median	217
SD	378.2	Std. Error of Mean	142.9
Coefficient of Variation	1.04	Skewness	1.052

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	641.4	95% Adjusted-CLT UCL (Chen-1995)	659.5
		95% Modified-t UCL (Johnson-1978)	650.9

Gamma GOF Test

A-D Test Statistic	0.261	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.172	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.32	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.989	k star (bias corrected MLE)	0.66
Theta hat (MLE)	367.8	Theta star (bias corrected MLE)	550.9
nu hat (MLE)	13.84	nu star (bias corrected)	9.243
MLE Mean (bias corrected)	363.7	MLE Sd (bias corrected)	447.6
		Approximate Chi Square Value (0.05)	3.474
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	2.495

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	967.5	95% Adjusted Gamma UCL (use when n<50)	1347

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk Lognormal GOF Test**

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.146	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.567	Mean of logged Data	5.312
Maximum of Logged Data	6.898	SD of logged Data	1.26

Assuming Lognormal Distribution

95% H-UCL	4428	90% Chebyshev (MVUE) UCL	921.3
95% Chebyshev (MVUE) UCL	1166	97.5% Chebyshev (MVUE) UCL	1506
99% Chebyshev (MVUE) UCL	2173		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	598.8	95% Jackknife UCL	641.4
95% Standard Bootstrap UCL	583.8	95% Bootstrap-t UCL	1004
95% Hall's Bootstrap UCL	2217	95% Percentile Bootstrap UCL	593.8
95% BCA Bootstrap UCL	618.3		
90% Chebyshev(Mean, Sd) UCL	792.5	95% Chebyshev(Mean, Sd) UCL	986.7
97.5% Chebyshev(Mean, Sd) UCL	1256	99% Chebyshev(Mean, Sd) UCL	1786

Suggested UCL to Use

95% Student's-t UCL 641.4

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.

Lead (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	93.4	Mean	398.7
Maximum	1060	Median	189
SD	412.3	Std. Error of Mean	155.8
Coefficient of Variation	1.034	Skewness	1.159

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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).

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.314	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	701.5	95% Adjusted-CLT UCL (Chen-1995)	727.9
		95% Modified-t UCL (Johnson-1978)	712.9

Gamma GOF Test

A-D Test Statistic	0.62	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.236	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.318	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.242	k star (bias corrected MLE)	0.805
Theta hat (MLE)	321	Theta star (bias corrected MLE)	495.3
nu hat (MLE)	17.39	nu star (bias corrected)	11.27
MLE Mean (bias corrected)	398.7	MLE Sd (bias corrected)	444.4
		Approximate Chi Square Value (0.05)	4.75
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	3.558

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	945.9	95% Adjusted Gamma UCL (use when n<50)	1263

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.865	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.185	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.537	Mean of logged Data	5.534
Maximum of Logged Data	6.966	SD of logged Data	1.01

Assuming Lognormal Distribution

95% H-UCL	1960	90% Chebyshev (MVUE) UCL	825
95% Chebyshev (MVUE) UCL	1025	97.5% Chebyshev (MVUE) UCL	1302
99% Chebyshev (MVUE) UCL	1847		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	655	95% Jackknife UCL	701.5
95% Standard Bootstrap UCL	638	95% Bootstrap-t UCL	1756
95% Hall's Bootstrap UCL	2522	95% Percentile Bootstrap UCL	646.1
95% BCA Bootstrap UCL	669.4		
90% Chebyshev(Mean, Sd) UCL	866.2	95% Chebyshev(Mean, Sd) UCL	1078
97.5% Chebyshev(Mean, Sd) UCL	1372	99% Chebyshev(Mean, Sd) UCL	1949

Suggested UCL to Use

95% Adjusted Gamma UCL 1263

Recommended UCL exceeds the maximum observation

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.

Lead (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	14.9	Mean	390.3
Maximum	1340	Median	59.7
SD	568.3	Std. Error of Mean	254.2
Coefficient of Variation	1.456	Skewness	1.643

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.765	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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)**

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Student's-t UCL	932.1	95% Adjusted-CLT UCL (Chen-1995)	1008
		95% Modified-t UCL (Johnson-1978)	963.2

Gamma GOF Test

A-D Test Statistic	0.395	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.305	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.371	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.518	k star (bias corrected MLE)	0.34
Theta hat (MLE)	753.9	Theta star (bias corrected MLE)	1147
nu hat (MLE)	5.177	nu star (bias corrected)	3.404
MLE Mean (bias corrected)	390.3	MLE Sd (bias corrected)	668.9
		Approximate Chi Square Value (0.05)	0.502
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.192

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2649	95% Adjusted Gamma UCL (use when n<50)	6904

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.236	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.701	Mean of logged Data	4.746
Maximum of Logged Data	7.2	SD of logged Data	1.892

Assuming Lognormal Distribution

95% H-UCL	3098543	90% Chebyshev (MVUE) UCL	1193
95% Chebyshev (MVUE) UCL	1562	97.5% Chebyshev (MVUE) UCL	2073
99% Chebyshev (MVUE) UCL	3077		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	808.3	95% Jackknife UCL	932.1
95% Standard Bootstrap UCL	765.5	95% Bootstrap-t UCL	10720
95% Hall's Bootstrap UCL	6849	95% Percentile Bootstrap UCL	813.7
95% BCA Bootstrap UCL	907.6		
90% Chebyshev(Mean, Sd) UCL	1153	95% Chebyshev(Mean, Sd) UCL	1498
97.5% Chebyshev(Mean, Sd) UCL	1978	99% Chebyshev(Mean, Sd) UCL	2919

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 932.1

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.

Lead (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	37.1	Mean	380.9
Maximum	1540	Median	119.4
SD	523.3	Std. Error of Mean	185
Coefficient of Variation	1.374	Skewness	1.932

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.725	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.298	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	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	731.4	95% Adjusted-CLT UCL (Chen-1995)	820.2
		95% Modified-t UCL (Johnson-1978)	752.5

Gamma GOF Test

A-D Test Statistic	0.475	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.247	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.755	k star (bias corrected MLE)	0.555
Theta hat (MLE)	504.8	Theta star (bias corrected MLE)	686.3

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

nu hat (MLE)	12.07	nu star (bias corrected)	8.88
MLE Mean (bias corrected)	380.9	MLE Sd (bias corrected)	511.3
		Approximate Chi Square Value (0.05)	3.254
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.455

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1039	95% Adjusted Gamma UCL (use when n<50)	1378

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.178	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.614	Mean of logged Data	5.15
Maximum of Logged Data	7.34	SD of logged Data	1.344

Assuming Lognormal Distribution

95% H-UCL	3808	90% Chebyshev (MVUE) UCL	876.3
95% Chebyshev (MVUE) UCL	1111	97.5% Chebyshev (MVUE) UCL	1437
99% Chebyshev (MVUE) UCL	2076		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	685.2	95% Jackknife UCL	731.4
95% Standard Bootstrap UCL	663.3	95% Bootstrap-t UCL	1521
95% Hall's Bootstrap UCL	1864	95% Percentile Bootstrap UCL	700.8
95% BCA Bootstrap UCL	842		
90% Chebyshev(Mean, Sd) UCL	935.9	95% Chebyshev(Mean, Sd) UCL	1187
97.5% Chebyshev(Mean, Sd) UCL	1536	99% Chebyshev(Mean, Sd) UCL	2222

Suggested UCL to Use

95% Adjusted Gamma UCL	1378

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.

Lead (so-11)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	98.5	Mean	208.3
Maximum	486	Median	153
SD	148.6	Std. Error of Mean	60.67
Coefficient of Variation	0.714	Skewness	1.686

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.801	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	330.5	95% Adjusted-CLT UCL (Chen-1995)	352.7
		95% Modified-t UCL (Johnson-1978)	337.5

Gamma GOF Test

A-D Test Statistic	0.418	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.227	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.335	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.006	k star (bias corrected MLE)	1.614
Theta hat (MLE)	69.29	Theta star (bias corrected MLE)	129
nu hat (MLE)	36.07	nu star (bias corrected)	19.37
MLE Mean (bias corrected)	208.3	MLE Sd (bias corrected)	163.9
		Approximate Chi Square Value (0.05)	10.39
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	8.121

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	388.3	95% Adjusted Gamma UCL (use when n<50)	496.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.201	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.59	Mean of logged Data	5.163
Maximum of Logged Data	6.186	SD of logged Data	0.62

Assuming Lognormal Distribution

95% H-UCL	479.2	90% Chebyshev (MVUE) UCL	359
95% Chebyshev (MVUE) UCL	429.1	97.5% Chebyshev (MVUE) UCL	526.4
99% Chebyshev (MVUE) UCL	717.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	308	95% Jackknife UCL	330.5
95% Standard Bootstrap UCL	300	95% Bootstrap-t UCL	619.8
95% Hall's Bootstrap UCL	760.1	95% Percentile Bootstrap UCL	310.4
95% BCA Bootstrap UCL	323.8		
90% Chebyshev(Mean, Sd) UCL	390.3	95% Chebyshev(Mean, Sd) UCL	472.7
97.5% Chebyshev(Mean, Sd) UCL	587.1	99% Chebyshev(Mean, Sd) UCL	811.9

Suggested UCL to Use

95% Student's-t UCL	330.5

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.

Lead (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	22.6	Mean	472.3
Maximum	1320	Median	180
SD	542.7	Std. Error of Mean	242.7
Coefficient of Variation	1.149	Skewness	1.216

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Shapiro Wilk Test Statistic	0.851	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.305	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	989.8	95% Adjusted-CLT UCL (Chen-1995)	1013
		95% Modified-t UCL (Johnson-1978)	1012

Gamma GOF Test

A-D Test Statistic	0.24	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.229	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.366	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.773	k star (bias corrected MLE)	0.443
Theta hat (MLE)	610.7	Theta star (bias corrected MLE)	1067
nu hat (MLE)	7.734	nu star (bias corrected)	4.427
MLE Mean (bias corrected)	472.3	MLE Sd (bias corrected)	709.9
		Approximate Chi Square Value (0.05)	0.897
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.39

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2330	95% Adjusted Gamma UCL (use when n<50)	5362

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.118	Mean of logged Data	5.387
Maximum of Logged Data	7.185	SD of logged Data	1.586

Assuming Lognormal Distribution

95% H-UCL	296454	90% Chebyshev (MVUE) UCL	1520
95% Chebyshev (MVUE) UCL	1970	97.5% Chebyshev (MVUE) UCL	2595
99% Chebyshev (MVUE) UCL	3823		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	871.6	95% Jackknife UCL	989.8
95% Standard Bootstrap UCL	831.3	95% Bootstrap-t UCL	2955
95% Hall's Bootstrap UCL	4535	95% Percentile Bootstrap UCL	847.2
95% BCA Bootstrap UCL	854.2		
90% Chebyshev(Mean, Sd) UCL	1200	95% Chebyshev(Mean, Sd) UCL	1530
97.5% Chebyshev(Mean, Sd) UCL	1988	99% Chebyshev(Mean, Sd) UCL	2887

Suggested UCL to Use

95% Student's-t UCL 989.8

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.

Lead (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	183	Mean	861.7
Maximum	2610	Median	857
SD	852.1	Std. Error of Mean	322.1
Coefficient of Variation	0.989	Skewness	1.703

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.79	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.283	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	1488	95% Adjusted-CLT UCL (Chen-1995)	1613
		95% Modified-t UCL (Johnson-1978)	1522

Gamma GOF Test

A-D Test Statistic	0.448	**Anderson-Darling Gamma GOF Test**

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.228	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.318	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.337	k star (bias corrected MLE)	0.859
Theta hat (MLE)	644.7	Theta star (bias corrected MLE)	1003
nu hat (MLE)	18.71	nu star (bias corrected)	12.03
MLE Mean (bias corrected)	861.7	MLE Sd (bias corrected)	929.8
		Approximate Chi Square Value (0.05)	5.244
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	3.976

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1976	95% Adjusted Gamma UCL (use when n<50)	2606

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.891	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.209	Mean of logged Data	6.34
Maximum of Logged Data	7.867	SD of logged Data	1.013

Assuming Lognormal Distribution

95% H-UCL	4432	90% Chebyshev (MVUE) UCL	1853
95% Chebyshev (MVUE) UCL	2303	97.5% Chebyshev (MVUE) UCL	2927
99% Chebyshev (MVUE) UCL	4152		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1391	95% Jackknife UCL	1488
95% Standard Bootstrap UCL	1348	95% Bootstrap-t UCL	1909
95% Hall's Bootstrap UCL	3480	95% Percentile Bootstrap UCL	1404
95% BCA Bootstrap UCL	1570		
90% Chebyshev(Mean, Sd) UCL	1828	95% Chebyshev(Mean, Sd) UCL	2266
97.5% Chebyshev(Mean, Sd) UCL	2873	99% Chebyshev(Mean, Sd) UCL	4066

Suggested UCL to Use

95% Student's-t UCL 1488

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Lead (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	71.1	Mean	374.8
Maximum	1030	Median	273
SD	391.3	Std. Error of Mean	175
Coefficient of Variation	1.044	Skewness	1.599

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	747.8	95% Adjusted-CLT UCL (Chen-1995)	796.3
		95% Modified-t UCL (Johnson-1978)	768.7

Gamma GOF Test

A-D Test Statistic	0.281	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.225	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.236	k star (bias corrected MLE)	0.628
Theta hat (MLE)	303.3	Theta star (bias corrected MLE)	597.1
nu hat (MLE)	12.36	nu star (bias corrected)	6.277
MLE Mean (bias corrected)	374.8	MLE Sd (bias corrected)	473.1

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

		Approximate Chi Square Value (0.05)	1.783
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.928

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1319	95% Adjusted Gamma UCL (use when n<50)	2534

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.204	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.264	Mean of logged Data	5.47
Maximum of Logged Data	6.937	SD of logged Data	1.095

Assuming Lognormal Distribution

95% H-UCL	7966	90% Chebyshev (MVUE) UCL	889.2
95% Chebyshev (MVUE) UCL	1124	97.5% Chebyshev (MVUE) UCL	1449
99% Chebyshev (MVUE) UCL	2089		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	662.6	95% Jackknife UCL	747.8
95% Standard Bootstrap UCL	634	95% Bootstrap-t UCL	1188
95% Hall's Bootstrap UCL	1869	95% Percentile Bootstrap UCL	655.1
95% BCA Bootstrap UCL	713.6		
90% Chebyshev(Mean, Sd) UCL	899.8	95% Chebyshev(Mean, Sd) UCL	1138
97.5% Chebyshev(Mean, Sd) UCL	1468	99% Chebyshev(Mean, Sd) UCL	2116

Suggested UCL to Use

95% Student's-t UCL 747.8

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.

Lead (so-15)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Minimum	51.4	Mean	1304
Maximum	3740	Median	122
SD	2110	Std. Error of Mean	1218
Coefficient of Variation	1.617	Skewness	1.73

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.764	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.379	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	4861	95% Adjusted-CLT UCL (Chen-1995)	4608
		95% Modified-t UCL (Johnson-1978)	5064

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	0.429	k star (bias corrected MLE)	N/A
Theta hat (MLE)	3041	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.574	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.313	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.94	Mean of logged Data	5.657
Maximum of Logged Data	8.227	SD of logged Data	2.267

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	1.621E+24	90% Chebyshev (MVUE) UCL	3661
95% Chebyshev (MVUE) UCL	4853	97.5% Chebyshev (MVUE) UCL	6506
99% Chebyshev (MVUE) UCL	9754		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3308	95% Jackknife UCL	4861
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	4958	95% Chebyshev(Mean, Sd) UCL	6613
97.5% Chebyshev(Mean, Sd) UCL	8910	99% Chebyshev(Mean, Sd) UCL	13423

Suggested UCL to Use

95% Student's-t UCL 4861

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Lead (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	327	Mean	1728
Maximum	5310	Median	1173
SD	1881	Std. Error of Mean	768
Coefficient of Variation	1.089	Skewness	1.792

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.775	**Shapiro Wilk GOF Test**	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.299	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	3275	95% Adjusted-CLT UCL (Chen-1995)	3592
		95% Modified-t UCL (Johnson-1978)	3369

Gamma GOF Test

A-D Test Statistic	0.401	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.712	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.262	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.339	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.215	k star (bias corrected MLE)	0.719
Theta hat (MLE)	1422	Theta star (bias corrected MLE)	2404
nu hat (MLE)	14.58	nu star (bias corrected)	8.624
MLE Mean (bias corrected)	1728	MLE Sd (bias corrected)	2038
		Approximate Chi Square Value (0.05)	3.102
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	2.035

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	4805	95% Adjusted Gamma UCL (use when n<50)	7322

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.79	Mean of logged Data	6.99
Maximum of Logged Data	8.577	SD of logged Data	1.054

Assuming Lognormal Distribution

95% H-UCL	14465	90% Chebyshev (MVUE) UCL	3802
95% Chebyshev (MVUE) UCL	4764	97.5% Chebyshev (MVUE) UCL	6098
99% Chebyshev (MVUE) UCL	8721		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	2991	95% Jackknife UCL	3275
95% Standard Bootstrap UCL	2886	95% Bootstrap-t UCL	5017
95% Hall's Bootstrap UCL	7401	95% Percentile Bootstrap UCL	2993
95% BCA Bootstrap UCL	3331		
90% Chebyshev(Mean, Sd) UCL	4032	95% Chebyshev(Mean, Sd) UCL	5075
97.5% Chebyshev(Mean, Sd) UCL	6524	99% Chebyshev(Mean, Sd) UCL	9369

Suggested UCL to Use

95% Student's-t UCL 3275

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Lead (so-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	49.7	Mean	285.6
Maximum	997	Median	216
SD	299.8	Std. Error of Mean	106
Coefficient of Variation	1.05	Skewness	2.376

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.693	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.362	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.283	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	486.3	95% Adjusted-CLT UCL (Chen-1995)	555
		95% Modified-t UCL (Johnson-1978)	501.2

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma GOF Test

A-D Test Statistic	0.436	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.252	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.299	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.524	k star (bias corrected MLE)	1.036
Theta hat (MLE)	187.3	Theta star (bias corrected MLE)	275.6
nu hat (MLE)	24.39	nu star (bias corrected)	16.58
MLE Mean (bias corrected)	285.6	MLE Sd (bias corrected)	280.5
		Approximate Chi Square Value (0.05)	8.371
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	6.948

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	565.5	95% Adjusted Gamma UCL (use when n<50)	681.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.204	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.906	Mean of logged Data	5.292
Maximum of Logged Data	6.905	SD of logged Data	0.892

Assuming Lognormal Distribution

95% H-UCL	860.5	90% Chebyshev (MVUE) UCL	546.5
95% Chebyshev (MVUE) UCL	668.1	97.5% Chebyshev (MVUE) UCL	836.9
99% Chebyshev (MVUE) UCL	1168		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	459.9	95% Jackknife UCL	486.3
95% Standard Bootstrap UCL	447.6	95% Bootstrap-t UCL	771.1
95% Hall's Bootstrap UCL	1217	95% Percentile Bootstrap UCL	473.3
95% BCA Bootstrap UCL	534.6		
90% Chebyshev(Mean, Sd) UCL	603.5	95% Chebyshev(Mean, Sd) UCL	747.5
97.5% Chebyshev(Mean, Sd) UCL	947.4	99% Chebyshev(Mean, Sd) UCL	1340

Suggested UCL to Use

95% Adjusted Gamma UCL	681.3

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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.

Lead (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	2
Minimum	33.7	Mean	162.5
Maximum	399	Median	102
SD	150.4	Std. Error of Mean	56.84
Coefficient of Variation	0.925	Skewness	1.052

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.804	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.284	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	273	95% Adjusted-CLT UCL (Chen-1995)	280.2
		95% Modified-t UCL (Johnson-1978)	276.7

Gamma GOF Test

A-D Test Statistic	0.402	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.195	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.317	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.452	k star (bias corrected MLE)	0.925
Theta hat (MLE)	111.9	Theta star (bias corrected MLE)	175.7
nu hat (MLE)	20.33	nu star (bias corrected)	12.95
MLE Mean (bias corrected)	162.5	MLE Sd (bias corrected)	168.9
		Approximate Chi Square Value (0.05)	5.86

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	4.503

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	359.1	95% Adjusted Gamma UCL (use when n<50)	467.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.517	Mean of logged Data	4.708
Maximum of Logged Data	5.989	SD of logged Data	0.953

Assuming Lognormal Distribution

95% H-UCL	699.8	90% Chebyshev (MVUE) UCL	335.6
95% Chebyshev (MVUE) UCL	414.8	97.5% Chebyshev (MVUE) UCL	524.7
99% Chebyshev (MVUE) UCL	740.5		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	256	95% Jackknife UCL	273
95% Standard Bootstrap UCL	247.7	95% Bootstrap-t UCL	487.1
95% Hall's Bootstrap UCL	959.2	95% Percentile Bootstrap UCL	252.3
95% BCA Bootstrap UCL	258.5		
90% Chebyshev(Mean, Sd) UCL	333	95% Chebyshev(Mean, Sd) UCL	410.3
97.5% Chebyshev(Mean, Sd) UCL	517.5	99% Chebyshev(Mean, Sd) UCL	728.1

Suggested UCL to Use

95% Student's-t UCL	273

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 Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 1:02:43 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls
Full Precision	OFF
Confidence Coefficient	95%

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Number of Bootstrap Operations 2000

Dieldrin (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	2	Number of Non-Detects	3
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	0.098	Minimum Non-Detect	0.21
Maximum Detect	2.1	Maximum Non-Detect	0.23
Variance Detects	2.004	Percent Non-Detects	60%
Mean Detects	1.099	SD Detects	1.416
Median Detects	1.099	CV Detects	1.288
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.79	SD of Logged Detects	2.167

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.498	KM Standard Error of Mean	0.506
KM SD	0.801	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.578	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.331	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	2.018	95% KM Chebyshev UCL	2.706
97.5% KM Chebyshev UCL	3.661	99% KM Chebyshev UCL	5.538

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.685	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.604	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.74	nu star (bias corrected)	N/A
Mean (detects)	1.099		

Estimates of Gamma Parameters using KM Estimates

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean (KM)	0.498	SD (KM)	0.801
Variance (KM)	0.641	SE of Mean (KM)	0.506
k hat (KM)	0.387	k star (KM)	0.288
nu hat (KM)	3.874	nu star (KM)	2.883
theta hat (KM)	1.287	theta star (KM)	1.729
80% gamma percentile (KM)	0.757	90% gamma percentile (KM)	1.477
95% gamma percentile (KM)	2.309	99% gamma percentile (KM)	4.483

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0086
Approximate Chi Square Value (2.88, α)	0.339	Adjusted Chi Square Value (2.88, β)	0.126
95% Gamma Approximate KM-UCL (use when n>=50)	4.244	95% Gamma Adjusted KM-UCL (use when n<50)	11.36

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	0.498	Mean in Log Scale	-1.71
SD in Original Scale	0.895	SD in Log Scale	1.371
95% t UCL (assumes normality of ROS data)	1.352	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	40.84		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.71	KM Geo Mean	0.181
KM SD (logged)	1.226	95% Critical H Value (KM-Log)	5.894
KM Standard Error of Mean (logged)	0.775	95% H-UCL (KM -Log)	14.21
KM SD (logged)	1.226	95% Critical H Value (KM-Log)	5.894
KM Standard Error of Mean (logged)	0.775		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.506	Mean in Log Scale	-1.641
SD in Original Scale	0.891	SD in Log Scale	1.333
95% t UCL (Assumes normality)	1.355	95% H-Stat UCL	32.98

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

KM Bootstrap t UCL N/A

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Dieldrin (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Number of Detects	0	Number of Non-Detects	1
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Dieldrin (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Dieldrin (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.05	Minimum Non-Detect	0.024
Maximum Detect	0.36	Maximum Non-Detect	0.083
Variance Detects	0.0254	Percent Non-Detects	40%
Mean Detects	0.227	SD Detects	0.159
Median Detects	0.27	CV Detects	0.704
Skewness Detects	-1.132	Kurtosis Detects	N/A
Mean of Logged Detects	-1.776	SD of Logged Detects	1.066

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.148	KM Standard Error of Mean	0.0765
KM SD	0.139	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.311	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.274	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.378	95% KM Chebyshev UCL	0.482
97.5% KM Chebyshev UCL	0.626	99% KM Chebyshev UCL	0.909

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.866	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.121	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11.2	nu star (bias corrected)	N/A
Mean (detects)	0.227		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.14
Maximum	0.36	Median	0.05
SD	0.164	CV	1.169
k hat (MLE)	0.649	k star (bias corrected MLE)	0.393
Theta hat (MLE)	0.216	Theta star (bias corrected MLE)	0.356
nu hat (MLE)	6.49	nu star (bias corrected)	3.929
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (3.93, α)	0.694	Adjusted Chi Square Value (3.93, β)	0.283
95% Gamma Approximate UCL (use when n>=50)	0.793	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.148	SD (KM)	0.139
Variance (KM)	0.0195	SE of Mean (KM)	0.0765
k hat (KM)	1.129	k star (KM)	0.585
nu hat (KM)	11.29	nu star (KM)	5.848
theta hat (KM)	0.131	theta star (KM)	0.253
80% gamma percentile (KM)	0.244	90% gamma percentile (KM)	0.388
95% gamma percentile (KM)	0.538	99% gamma percentile (KM)	0.903

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.85, α)	1.563	Adjusted Chi Square Value (5.85, β)	0.786
95% Gamma Approximate KM-UCL (use when n>=50)	0.555	95% Gamma Adjusted KM-UCL (use when n<50)	1.102

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.857	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.336	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.144	Mean in Log Scale	-2.645
SD in Original Scale	0.16	SD in Log Scale	1.441
95% t UCL (assumes normality of ROS data)	0.296	95% Percentile Bootstrap UCL	0.258
95% BCA Bootstrap UCL	0.262	95% Bootstrap t UCL	1.142
95% H-UCL (Log ROS)	27.95		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.484	KM Geo Mean	0.0834
KM SD (logged)	1.117	95% Critical H Value (KM-Log)	5.413
KM Standard Error of Mean (logged)	0.622	95% H-UCL (KM -Log)	3.2
KM SD (logged)	1.117	95% Critical H Value (KM-Log)	5.413
KM Standard Error of Mean (logged)	0.622		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.147	Mean in Log Scale	-2.586
SD in Original Scale	0.158	SD in Log Scale	1.412
95% t UCL (Assumes normality)	0.297	95% H-Stat UCL	23.5

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	0.311

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.

Dieldrin (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Minimum	0.1	Mean	0.205
Maximum	0.31	Median	0.205

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Dieldrin (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Dieldrin (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	8
Minimum Detect	0.032	Minimum Non-Detect	0.038
Maximum Detect	0.47	Maximum Non-Detect	0.5
Variance Detects	0.0576	Percent Non-Detects	72.73%
Mean Detects	0.194	SD Detects	0.24
Median Detects	0.081	CV Detects	1.235
Skewness Detects	1.651	Kurtosis Detects	N/A
Mean of Logged Detects	-2.237	SD of Logged Detects	1.365

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	0.833	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.348	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0846	KM Standard Error of Mean	0.0507
KM SD	0.13	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.176	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.168	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.237	95% KM Chebyshev UCL	0.306
97.5% KM Chebyshev UCL	0.401	99% KM Chebyshev UCL	0.589

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.968	k star (bias corrected MLE)	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Theta hat (MLE)	0.201	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.808	nu star (bias corrected)	N/A
Mean (detects)	0.194		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0611
Maximum	0.47	Median	0.01
SD	0.137	CV	2.248
k hat (MLE)	0.564	k star (bias corrected MLE)	0.471
Theta hat (MLE)	0.108	Theta star (bias corrected MLE)	0.13
nu hat (MLE)	12.4	nu star (bias corrected)	10.35
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (10.35, α)	4.164	Adjusted Chi Square Value (10.35, β)	3.547
95% Gamma Approximate UCL (use when n>=50)	0.152	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0846	SD (KM)	0.13
Variance (KM)	0.0168	SE of Mean (KM)	0.0507
k hat (KM)	0.425	k star (KM)	0.37
nu hat (KM)	9.35	nu star (KM)	8.134
theta hat (KM)	0.199	theta star (KM)	0.229
80% gamma percentile (KM)	0.135	90% gamma percentile (KM)	0.242
95% gamma percentile (KM)	0.361	99% gamma percentile (KM)	0.663

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.13, α)	2.813	Adjusted Chi Square Value (8.13, β)	2.328
95% Gamma Approximate KM-UCL (use when n>=50)	0.245	95% Gamma Adjusted KM-UCL (use when n<50)	0.296

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.0772	Mean in Log Scale	-3.096
SD in Original Scale	0.131	SD in Log Scale	0.836
95% t UCL (assumes normality of ROS data)	0.149	95% Percentile Bootstrap UCL	0.153
95% BCA Bootstrap UCL	0.195	95% Bootstrap t UCL	1.196
95% H-UCL (Log ROS)	0.131		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.006	KM Geo Mean	0.0495
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	2.682
KM Standard Error of Mean (logged)	0.344	95% H-UCL (KM -Log)	0.141
KM SD (logged)	0.829	95% Critical H Value (KM-Log)	2.682
KM Standard Error of Mean (logged)	0.344		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.125	Mean in Log Scale	-2.582
SD in Original Scale	0.138	SD in Log Scale	1.049
95% t UCL (Assumes normality)	0.201	95% H-Stat UCL	0.366

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	0.176

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.

Dieldrin (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	0.48	Mean	0.917
Maximum	1.5	Median	0.77
SD	0.526	Std. Error of Mean	0.303
Coefficient of Variation	0.573	Skewness	1.158

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.277	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.803	95% Adjusted-CLT UCL (Chen-1995)	1.633
		95% Modified-t UCL (Johnson-1978)	1.837

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	4.722	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.194	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	28.33	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.99	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.212	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.734	Mean of logged Data	-0.197
Maximum of Logged Data	0.405	SD of logged Data	0.572

Assuming Lognormal Distribution

95% H-UCL	19.68	90% Chebyshev (MVUE) UCL	1.785
95% Chebyshev (MVUE) UCL	2.179	97.5% Chebyshev (MVUE) UCL	2.727
99% Chebyshev (MVUE) UCL	3.802		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.416	95% Jackknife UCL	1.803
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	1.827	95% Chebyshev(Mean, Sd) UCL	2.239
97.5% Chebyshev(Mean, Sd) UCL	2.812	99% Chebyshev(Mean, Sd) UCL	3.936

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% Student's-t UCL 1.803

Recommended UCL exceeds the maximum observation

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.

Dieldrin (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.055	Minimum Non-Detect	0.024
Maximum Detect	1.3	Maximum Non-Detect	0.45
Variance Detects	0.775	Percent Non-Detects	71.43%
Mean Detects	0.678	SD Detects	0.88
Median Detects	0.678	CV Detects	1.299
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.319	SD of Logged Detects	2.236

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.22	KM Standard Error of Mean	0.236
KM SD	0.441	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.678	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.608	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.928	95% KM Chebyshev UCL	1.249
97.5% KM Chebyshev UCL	1.694	99% KM Chebyshev UCL	2.569

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.656	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.033	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.624	nu star (bias corrected)	N/A
Mean (detects)	0.678		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.22	SD (KM)	0.441
Variance (KM)	0.195	SE of Mean (KM)	0.236
k hat (KM)	0.248	k star (KM)	0.237
nu hat (KM)	3.466	nu star (KM)	3.314
theta hat (KM)	0.887	theta star (KM)	0.928
80% gamma percentile (KM)	0.312	90% gamma percentile (KM)	0.661
95% gamma percentile (KM)	1.08	99% gamma percentile (KM)	2.203

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (3.31, α)	0.471	Adjusted Chi Square Value (3.31, β)	0.246
95% Gamma Approximate KM-UCL (use when n>=50)	1.544	95% Gamma Adjusted KM-UCL (use when n<50)	2.956

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	0.202	Mean in Log Scale	-3.833
SD in Original Scale	0.484	SD in Log Scale	2.138
95% t UCL (assumes normality of ROS data)	0.558	95% Percentile Bootstrap UCL	0.563
95% BCA Bootstrap UCL	0.581	95% Bootstrap t UCL	8.835
95% H-UCL (Log ROS)	112.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.804	KM Geo Mean	0.0606
KM SD (logged)	1.309	95% Critical H Value (KM-Log)	4.603
KM Standard Error of Mean (logged)	0.758	95% H-UCL (KM -Log)	1.672
KM SD (logged)	1.309	95% Critical H Value (KM-Log)	4.603
KM Standard Error of Mean (logged)	0.758		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.271	Mean in Log Scale	-2.331
SD in Original Scale	0.462	SD in Log Scale	1.53
95% t UCL (Assumes normality)	0.611	95% H-Stat UCL	8.483

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

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

KM Bootstrap t UCL N/A

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.

Dieldrin (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.1	Minimum Non-Detect	0.043
Maximum Detect	0.53	Maximum Non-Detect	0.4
Variance Detects	0.0925	Percent Non-Detects	71.43%
Mean Detects	0.315	SD Detects	0.304
Median Detects	0.315	CV Detects	0.965
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.469	SD of Logged Detects	1.179

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

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

KM Mean	0.129	KM Standard Error of Mean	0.0895
KM SD	0.166	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.303	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.276	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.397	95% KM Chebyshev UCL	0.519
97.5% KM Chebyshev UCL	0.688	99% KM Chebyshev UCL	1.02

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.743	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.181	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.971	nu star (bias corrected)	N/A
Mean (detects)	0.315		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.129	SD (KM)	0.166
Variance (KM)	0.0274	SE of Mean (KM)	0.0895
k hat (KM)	0.605	k star (KM)	0.441
nu hat (KM)	8.472	nu star (KM)	6.175
theta hat (KM)	0.213	theta star (KM)	0.292
80% gamma percentile (KM)	0.21	90% gamma percentile (KM)	0.357
95% gamma percentile (KM)	0.517	99% gamma percentile (KM)	0.916

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (6.17, α)	1.73	Adjusted Chi Square Value (6.17, β)	1.114
95% Gamma Approximate KM-UCL (use when n>=50)	0.46	95% Gamma Adjusted KM-UCL (use when n<50)	0.714

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	0.104	Mean in Log Scale	-3.257
SD in Original Scale	0.19	SD in Log Scale	1.351
95% t UCL (assumes normality of ROS data)	0.244	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	1.305		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.547	KM Geo Mean	0.0783
KM SD (logged)	0.863	95% Critical H Value (KM-Log)	3.32
KM Standard Error of Mean (logged)	0.502	95% H-UCL (KM -Log)	0.366
KM SD (logged)	0.863	95% Critical H Value (KM-Log)	3.32
KM Standard Error of Mean (logged)	0.502		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.161	Mean in Log Scale	-2.263
SD in Original Scale	0.173	SD in Log Scale	1.027
95% t UCL (Assumes normality)	0.288	95% H-Stat UCL	0.859

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

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.519

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.

Dieldrin (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.018	Minimum Non-Detect	0.41
Maximum Detect	1.3	Maximum Non-Detect	4.4
Variance Detects	0.532	Percent Non-Detects	40%
Mean Detects	0.458	SD Detects	0.73
Median Detects	0.055	CV Detects	1.594
Skewness Detects	1.727	Kurtosis Detects	N/A
Mean of Logged Detects	-2.218	SD of Logged Detects	2.22

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.772	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.376	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.352	KM Standard Error of Mean	0.335
KM SD	0.547	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.067	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.904	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.358	95% KM Chebyshev UCL	1.814
97.5% KM Chebyshev UCL	2.446	99% KM Chebyshev UCL	3.688

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.45	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.018	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.697	nu star (bias corrected)	N/A
Mean (detects)	0.458		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.018	Mean	0.306
Maximum	1.3	Median	0.055
SD	0.558	CV	1.823
k hat (MLE)	0.477	k star (bias corrected MLE)	0.324
Theta hat (MLE)	0.642	Theta star (bias corrected MLE)	0.944
nu hat (MLE)	4.77	nu star (bias corrected)	3.241
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (3.24, α)	0.447	Adjusted Chi Square Value (3.24, β)	0.169
95% Gamma Approximate UCL (use when n>=50)	2.218	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.352	SD (KM)	0.547
Variance (KM)	0.3	SE of Mean (KM)	0.335
k hat (KM)	0.414	k star (KM)	0.299
nu hat (KM)	4.145	nu star (KM)	2.991
theta hat (KM)	0.85	theta star (KM)	1.178
80% gamma percentile (KM)	0.54	90% gamma percentile (KM)	1.04
95% gamma percentile (KM)	1.613	99% gamma percentile (KM)	3.105

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.99, α)	0.37	Adjusted Chi Square Value (2.99, β)	0.138
95% Gamma Approximate KM-UCL (use when n>=50)	2.85	95% Gamma Adjusted KM-UCL (use when n<50)	7.631

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.287	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.296	Mean in Log Scale	-2.522

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

SD in Original Scale	0.561	SD in Log Scale	1.646
95% t UCL (assumes normality of ROS data)	0.832	95% Percentile Bootstrap UCL	0.795
95% BCA Bootstrap UCL	0.806	95% Bootstrap t UCL	9.493
95% H-UCL (Log ROS)	187.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.529	KM Geo Mean	0.0798
KM SD (logged)	1.682	95% Critical H Value (KM-Log)	7.943
KM Standard Error of Mean (logged)	1.051	95% H-UCL (KM -Log)	262
KM SD (logged)	1.682	95% Critical H Value (KM-Log)	7.943
KM Standard Error of Mean (logged)	1.051		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.756	Mean in Log Scale	-1.49
SD in Original Scale	0.964	SD in Log Scale	2.04
95% t UCL (Assumes normality)	1.675	95% H-Stat UCL	31326

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	1.067

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.

Dieldrin (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (so-10x) was not processed!

Dieldrin (so-11)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	1	Number of Non-Detects	5
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 Dieldrin (so-11) was not processed!

Dieldrin (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 Dieldrin (so-12) was not processed!

Dieldrin (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 Dieldrin (so-13) was not processed!

Dieldrin (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (so-14x) was not processed!

Dieldrin (so-15)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Number of Detects	0	Number of Non-Detects	3
Number of Distinct Detects	0	Number of Distinct Non-Detects	3

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (so-15) was not processed!

Dieldrin (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	4
		Number of Missing Observations	2
Number of Detects	0	Number of Non-Detects	6
Number of Distinct Detects	0	Number of Distinct Non-Detects	4

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (so-16) was not processed!

Dieldrin (so-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

The data set for variable Dieldrin (so-17) was not processed!

Dieldrin (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 Dieldrin (so-18) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 1:01:50 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDT (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	0.35	Mean	2.19
Maximum	4.1	Median	2.4
SD	1.389	Std. Error of Mean	0.621
Coefficient of Variation	0.634	Skewness	0.0758

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.985	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3.515	95% Adjusted-CLT UCL (Chen-1995)	3.235
		95% Modified-t UCL (Johnson-1978)	3.518

Gamma GOF Test

A-D Test Statistic	0.326	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.042	k star (bias corrected MLE)	0.95
Theta hat (MLE)	1.072	Theta star (bias corrected MLE)	2.305
nu hat (MLE)	20.42	nu star (bias corrected)	9.502
MLE Mean (bias corrected)	2.19	MLE Sd (bias corrected)	2.247
		Approximate Chi Square Value (0.05)	3.633
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	2.236

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	5.728	95% Adjusted Gamma UCL (use when n<50)	9.307

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.05	Mean of logged Data	0.52
Maximum of Logged Data	1.411	SD of logged Data	0.947

Assuming Lognormal Distribution

95% H-UCL	24.11	90% Chebyshev (MVUE) UCL	5.251
95% Chebyshev (MVUE) UCL	6.56	97.5% Chebyshev (MVUE) UCL	8.376
99% Chebyshev (MVUE) UCL	11.95		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.212	95% Jackknife UCL	3.515
95% Standard Bootstrap UCL	3.079	95% Bootstrap-t UCL	3.558

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Hall's Bootstrap UCL	3.353	95% Percentile Bootstrap UCL	3.12
95% BCA Bootstrap UCL	3.08		
90% Chebyshev(Mean, Sd) UCL	4.054	95% Chebyshev(Mean, Sd) UCL	4.898
97.5% Chebyshev(Mean, Sd) UCL	6.07	99% Chebyshev(Mean, Sd) UCL	8.373

Suggested UCL to Use

95% Student's-t UCL 3.515

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 (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Minimum	0.055	Mean	0.055
Maximum	0.055	Median	0.055

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable 4,4'-DDT (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

4,4'-DDT (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	0.054	Mean	2.179
Maximum	4.4	Median	1.5
SD	1.962	Std. Error of Mean	0.877
Coefficient of Variation	0.9	Skewness	0.317

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Shapiro Wilk Test Statistic	0.877	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	4.049	95% Adjusted-CLT UCL (Chen-1995)	3.755
		95% Modified-t UCL (Johnson-1978)	4.07

Gamma GOF Test

A-D Test Statistic	0.34	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.697	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.239	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.366	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.804	k star (bias corrected MLE)	0.455
Theta hat (MLE)	2.71	Theta star (bias corrected MLE)	4.79
nu hat (MLE)	8.039	nu star (bias corrected)	4.549
MLE Mean (bias corrected)	2.179	MLE Sd (bias corrected)	3.23
		Approximate Chi Square Value (0.05)	0.95
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.419

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	10.44	95% Adjusted Gamma UCL (use when n<50)	23.66

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.848	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.919	Mean of logged Data	0.041
Maximum of Logged Data	1.482	SD of logged Data	1.795

Assuming Lognormal Distribution

95% H-UCL	10323	90% Chebyshev (MVUE) UCL	9.512
95% Chebyshev (MVUE) UCL	12.41	97.5% Chebyshev (MVUE) UCL	16.44
99% Chebyshev (MVUE) UCL	24.36		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	3.622	95% Jackknife UCL	4.049
95% Standard Bootstrap UCL	3.453	95% Bootstrap-t UCL	6.218
95% Hall's Bootstrap UCL	7.106	95% Percentile Bootstrap UCL	3.58
95% BCA Bootstrap UCL	3.568		
90% Chebyshev(Mean, Sd) UCL	4.811	95% Chebyshev(Mean, Sd) UCL	6.003
97.5% Chebyshev(Mean, Sd) UCL	7.657	99% Chebyshev(Mean, Sd) UCL	10.91

Suggested UCL to Use

95% Student's-t UCL 4.049

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 (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Minimum	1.3	Mean	2.35
Maximum	3.4	Median	2.35

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable 4,4'-DDT (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

4,4'-DDT (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	0.069	Mean	1.898
Maximum	8.6	Median	1.1
SD	2.463	Std. Error of Mean	0.743
Coefficient of Variation	1.298	Skewness	2.281

Normal GOF Test

Shapiro Wilk Test Statistic 0.716 **Shapiro Wilk GOF Test**

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	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	3.244	95% Adjusted-CLT UCL (Chen-1995)	3.665
		95% Modified-t UCL (Johnson-1978)	3.329

Gamma GOF Test

A-D Test Statistic	0.381	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.766	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.193	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.705	k star (bias corrected MLE)	0.574
Theta hat (MLE)	2.691	Theta star (bias corrected MLE)	3.309
nu hat (MLE)	15.52	nu star (bias corrected)	12.62
MLE Mean (bias corrected)	1.898	MLE Sd (bias corrected)	2.506
		Approximate Chi Square Value (0.05)	5.638
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	4.898

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	4.249	95% Adjusted Gamma UCL (use when n<50)	4.89

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.674	Mean of logged Data	-0.215
Maximum of Logged Data	2.152	SD of logged Data	1.542

Assuming Lognormal Distribution

95% H-UCL	19.79	90% Chebyshev (MVUE) UCL	5.481
95% Chebyshev (MVUE) UCL	6.972	97.5% Chebyshev (MVUE) UCL	9.04
99% Chebyshev (MVUE) UCL	13.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCLs

95% CLT UCL	3.12	95% Jackknife UCL	3.244
95% Standard Bootstrap UCL	3.043	95% Bootstrap-t UCL	4.421
95% Hall's Bootstrap UCL	7.894	95% Percentile Bootstrap UCL	3.139
95% BCA Bootstrap UCL	3.741		
90% Chebyshev(Mean, Sd) UCL	4.126	95% Chebyshev(Mean, Sd) UCL	5.135
97.5% Chebyshev(Mean, Sd) UCL	6.536	99% Chebyshev(Mean, Sd) UCL	9.287

Suggested UCL to Use

95% Adjusted Gamma UCL 4.89

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 (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	4.8	Mean	6.3
Maximum	7.9	Median	6.2
SD	1.552	Std. Error of Mean	0.896
Coefficient of Variation	0.246	Skewness	0.289

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.997	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	8.917	95% Adjusted-CLT UCL (Chen-1995)	7.934
		95% Modified-t UCL (Johnson-1978)	8.942

Gamma GOF Test

Not Enough Data to Perform GOF Test

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics

k hat (MLE)	24.51	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.257	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	147	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	1	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.569	Mean of logged Data	1.82
Maximum of Logged Data	2.067	SD of logged Data	0.249

Assuming Lognormal Distribution

95% H-UCL	12.14	90% Chebyshev (MVUE) UCL	8.998
95% Chebyshev (MVUE) UCL	10.22	97.5% Chebyshev (MVUE) UCL	11.92
99% Chebyshev (MVUE) UCL	15.25		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	7.774	95% Jackknife UCL	8.917
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	8.989	95% Chebyshev(Mean, Sd) UCL	10.21
97.5% Chebyshev(Mean, Sd) UCL	11.9	99% Chebyshev(Mean, Sd) UCL	15.22

Suggested UCL to Use

95% Student's-t UCL 8.917

Recommended UCL exceeds the maximum observation

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

4,4'-DDT (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	0.18	Mean	1.821
Maximum	4.9	Median	1.1
SD	2.054	Std. Error of Mean	0.776
Coefficient of Variation	1.128	Skewness	1.037

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.768	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	3.33	95% Adjusted-CLT UCL (Chen-1995)	3.423
		95% Modified-t UCL (Johnson-1978)	3.381

Gamma GOF Test

A-D Test Statistic	0.477	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.321	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.846	k star (bias corrected MLE)	0.578
Theta hat (MLE)	2.154	Theta star (bias corrected MLE)	3.149
nu hat (MLE)	11.84	nu star (bias corrected)	8.097
MLE Mean (bias corrected)	1.821	MLE Sd (bias corrected)	2.395
		Approximate Chi Square Value (0.05)	2.792
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	1.942

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	5.283	95% Adjusted Gamma UCL (use when n<50)	7.596

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.892	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.222	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.715	Mean of logged Data	-0.0973
Maximum of Logged Data	1.589	SD of logged Data	1.355

Assuming Lognormal Distribution

95% H-UCL	31.27	90% Chebyshev (MVUE) UCL	4.703
95% Chebyshev (MVUE) UCL	5.987	97.5% Chebyshev (MVUE) UCL	7.769
99% Chebyshev (MVUE) UCL	11.27		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.098	95% Jackknife UCL	3.33
95% Standard Bootstrap UCL	2.997	95% Bootstrap-t UCL	6.338
95% Hall's Bootstrap UCL	12.71	95% Percentile Bootstrap UCL	3.067
95% BCA Bootstrap UCL	3.153		
90% Chebyshev(Mean, Sd) UCL	4.15	95% Chebyshev(Mean, Sd) UCL	5.205
97.5% Chebyshev(Mean, Sd) UCL	6.67	99% Chebyshev(Mean, Sd) UCL	9.546

Suggested UCL to Use

95% Student's-t UCL	3.33

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	0.14	Mean	2.037
Maximum	5.5	Median	1.8
SD	1.769	Std. Error of Mean	0.669

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Coefficient of Variation	0.869	Skewness	1.343

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	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	3.337	95% Adjusted-CLT UCL (Chen-1995)	3.5
		95% Modified-t UCL (Johnson-1978)	3.393

Gamma GOF Test

A-D Test Statistic	0.183	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.15	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.318	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.27	k star (bias corrected MLE)	0.821
Theta hat (MLE)	1.604	Theta star (bias corrected MLE)	2.481
nu hat (MLE)	17.79	nu star (bias corrected)	11.5
MLE Mean (bias corrected)	2.037	MLE Sd (bias corrected)	2.248
		Approximate Chi Square Value (0.05)	4.897
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	3.682

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	4.782	95% Adjusted Gamma UCL (use when n<50)	6.361

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.212	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.966	Mean of logged Data	0.269
Maximum of Logged Data	1.705	SD of logged Data	1.192

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Assuming Lognormal Distribution

95% H-UCL	21.05	90% Chebyshev (MVUE) UCL	5.422
95% Chebyshev (MVUE) UCL	6.832	97.5% Chebyshev (MVUE) UCL	8.788
99% Chebyshev (MVUE) UCL	12.63		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.137	95% Jackknife UCL	3.337
95% Standard Bootstrap UCL	3.053	95% Bootstrap-t UCL	3.954
95% Hall's Bootstrap UCL	9.174	95% Percentile Bootstrap UCL	3.163
95% BCA Bootstrap UCL	3.334		
90% Chebyshev(Mean, Sd) UCL	4.043	95% Chebyshev(Mean, Sd) UCL	4.952
97.5% Chebyshev(Mean, Sd) UCL	6.214	99% Chebyshev(Mean, Sd) UCL	8.691

Suggested UCL to Use

95% Student's-t UCL 3.337

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 (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	0.12	Mean	4.78
Maximum	14	Median	0.15
SD	6.559	Std. Error of Mean	2.933
Coefficient of Variation	1.372	Skewness	0.868

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.767	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Data Not Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	11.03	95% Adjusted-CLT UCL (Chen-1995)	10.82
		95% Modified-t UCL (Johnson-1978)	11.22

Gamma GOF Test

A-D Test Statistic	0.767	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.729	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.385	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.377	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.371	k star (bias corrected MLE)	0.282
Theta hat (MLE)	12.9	Theta star (bias corrected MLE)	16.98
nu hat (MLE)	3.706	nu star (bias corrected)	2.816
MLE Mean (bias corrected)	4.78	MLE Sd (bias corrected)	9.008
		Approximate Chi Square Value (0.05)	0.32
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.12

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	42.06	95% Adjusted Gamma UCL (use when n<50)	112.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.734	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.351	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.343	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.12	Mean of logged Data	-0.233
Maximum of Logged Data	2.639	SD of logged Data	2.45

Assuming Lognormal Distribution

95% H-UCL	19550438	90% Chebyshev (MVUE) UCL	17.37
95% Chebyshev (MVUE) UCL	22.97	97.5% Chebyshev (MVUE) UCL	30.75
99% Chebyshev (MVUE) UCL	46.02		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	9.605	95% Jackknife UCL	11.03
95% Standard Bootstrap UCL	9.069	95% Bootstrap-t UCL	2275
95% Hall's Bootstrap UCL	1018	95% Percentile Bootstrap UCL	9.426

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% BCA Bootstrap UCL	9.426		
90% Chebyshev(Mean, Sd) UCL	13.58	95% Chebyshev(Mean, Sd) UCL	17.57
97.5% Chebyshev(Mean, Sd) UCL	23.1	99% Chebyshev(Mean, Sd) UCL	33.96

Suggested UCL to Use

95% Student's-t UCL 11.03

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	3
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.055	Minimum Non-Detect	0.048
Maximum Detect	2	Maximum Non-Detect	0.22
Variance Detects	0.566	Percent Non-Detects	37.5%
Mean Detects	0.781	SD Detects	0.752
Median Detects	0.68	CV Detects	0.963
Skewness Detects	1.29	Kurtosis Detects	1.922
Mean of Logged Detects	-0.787	SD of Logged Detects	1.361

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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

KM Mean	0.507	KM Standard Error of Mean	0.252
KM SD	0.639	95% KM (BCA) UCL	0.948
95% KM (t) UCL	0.985	95% KM (Percentile Bootstrap) UCL	0.916
95% KM (z) UCL	0.922	95% KM Bootstrap t UCL	1.153
90% KM Chebyshev UCL	1.264	95% KM Chebyshev UCL	1.608

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

97.5% KM Chebyshev UCL	2.084	99% KM Chebyshev UCL	3.019

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.191	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.691	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.176	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.364	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)	1.061	k star (bias corrected MLE)	0.558
Theta hat (MLE)	0.736	Theta star (bias corrected MLE)	1.4
nu hat (MLE)	10.61	nu star (bias corrected)	5.579
Mean (detects)	0.781		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.492
Maximum	2	Median	0.178
SD	0.695	CV	1.412
k hat (MLE)	0.431	k star (bias corrected MLE)	0.353
Theta hat (MLE)	1.142	Theta star (bias corrected MLE)	1.395
nu hat (MLE)	6.893	nu star (bias corrected)	5.641
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (5.64, α)	1.459	Adjusted Chi Square Value (5.64, β)	0.99
95% Gamma Approximate UCL (use when n>=50)	1.901	95% Gamma Adjusted UCL (use when n<50)	2.804

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.507	SD (KM)	0.639
Variance (KM)	0.408	SE of Mean (KM)	0.252
k hat (KM)	0.63	k star (KM)	0.477
nu hat (KM)	10.08	nu star (KM)	7.634
theta hat (KM)	0.805	theta star (KM)	1.063
80% gamma percentile (KM)	0.831	90% gamma percentile (KM)	1.385
95% gamma percentile (KM)	1.98	99% gamma percentile (KM)	3.451

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.63, α)	2.525	Adjusted Chi Square Value (7.63, β)	1.846
95% Gamma Approximate KM-UCL (use when n>=50)	1.533	95% Gamma Adjusted KM-UCL (use when n<50)	2.097

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	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	0.498	Mean in Log Scale	-1.905
SD in Original Scale	0.69	SD in Log Scale	1.883
95% t UCL (assumes normality of ROS data)	0.96	95% Percentile Bootstrap UCL	0.906
95% BCA Bootstrap UCL	1.013	95% Bootstrap t UCL	1.426
95% H-UCL (Log ROS)	54.52		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.614	KM Geo Mean	0.199
KM SD (logged)	1.438	95% Critical H Value (KM-Log)	4.57
KM Standard Error of Mean (logged)	0.569	95% H-UCL (KM -Log)	6.703
KM SD (logged)	1.438	95% Critical H Value (KM-Log)	4.57
KM Standard Error of Mean (logged)	0.569		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.51	Mean in Log Scale	-1.626
SD in Original Scale	0.681	SD in Log Scale	1.602
95% t UCL (Assumes normality)	0.966	95% H-Stat UCL	14.86

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	0.985

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 (so-11)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	0.091	Mean	0.64
Maximum	2.1	Median	0.265
SD	0.793	Std. Error of Mean	0.324
Coefficient of Variation	1.238	Skewness	1.637

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.774	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.295	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	1.292	95% Adjusted-CLT UCL (Chen-1995)	1.403
		95% Modified-t UCL (Johnson-1978)	1.328

Gamma GOF Test

A-D Test Statistic	0.431	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.264	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.342	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.887	k star (bias corrected MLE)	0.554
Theta hat (MLE)	0.722	Theta star (bias corrected MLE)	1.155
nu hat (MLE)	10.64	nu star (bias corrected)	6.653
MLE Mean (bias corrected)	0.64	MLE Sd (bias corrected)	0.86
		Approximate Chi Square Value (0.05)	1.982
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	1.194

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2.149	95% Adjusted Gamma UCL (use when n<50)	3.567

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.234	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.397	Mean of logged Data	-1.107
Maximum of Logged Data	0.742	SD of logged Data	1.263

Assuming Lognormal Distribution

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% H-UCL	12.63	90% Chebyshev (MVUE) UCL	1.52
95% Chebyshev (MVUE) UCL	1.932	97.5% Chebyshev (MVUE) UCL	2.504
99% Chebyshev (MVUE) UCL	3.627		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.172	95% Jackknife UCL	1.292
95% Standard Bootstrap UCL	1.121	95% Bootstrap-t UCL	3.252
95% Hall's Bootstrap UCL	4.741	95% Percentile Bootstrap UCL	1.154
95% BCA Bootstrap UCL	1.3		
90% Chebyshev(Mean, Sd) UCL	1.611	95% Chebyshev(Mean, Sd) UCL	2.051
97.5% Chebyshev(Mean, Sd) UCL	2.661	99% Chebyshev(Mean, Sd) UCL	3.86

Suggested UCL to Use

95% Student's-t UCL 1.292

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.012	Minimum Non-Detect	0.044
Maximum Detect	2.6	Maximum Non-Detect	0.046
Variance Detects	2.18	Percent Non-Detects	40%
Mean Detects	0.896	SD Detects	1.476
Median Detects	0.075	CV Detects	1.648
Skewness Detects	1.729	Kurtosis Detects	N/A
Mean of Logged Detects	-2.019	SD of Logged Detects	2.734

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.768	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.542	KM Standard Error of Mean	0.564
KM SD	1.029	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.744	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.469	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	2.233	95% KM Chebyshev UCL	2.999
97.5% KM Chebyshev UCL	4.063	99% KM Chebyshev UCL	6.151

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.352	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.545	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.112	nu star (bias corrected)	N/A
Mean (detects)	0.896		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.541
Maximum	2.6	Median	0.012
SD	1.151	CV	2.126
k hat (MLE)	0.285	k star (bias corrected MLE)	0.247
Theta hat (MLE)	1.9	Theta star (bias corrected MLE)	2.189
nu hat (MLE)	2.85	nu star (bias corrected)	2.473
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.47, α)	0.235	Adjusted Chi Square Value (2.47, β)	0.0924
95% Gamma Approximate UCL (use when n>=50)	5.694	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.542	SD (KM)	1.029
Variance (KM)	1.059	SE of Mean (KM)	0.564
k hat (KM)	0.278	k star (KM)	0.244

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

nu hat (KM)	2.775	nu star (KM)	2.444
theta hat (KM)	1.954	theta star (KM)	2.219
80% gamma percentile (KM)	0.781	90% gamma percentile (KM)	1.63
95% gamma percentile (KM)	2.642	99% gamma percentile (KM)	5.346

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.44, α)	0.229	Adjusted Chi Square Value (2.44, β)	0.0905
95% Gamma Approximate KM-UCL (use when n>=50)	5.794	95% Gamma Adjusted KM-UCL (use when n<50)	14.65

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.541	Mean in Log Scale	-3.127
SD in Original Scale	1.152	SD in Log Scale	2.458
95% t UCL (assumes normality of ROS data)	1.639	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	1195910		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.981	KM Geo Mean	0.0508
KM SD (logged)	2.092	95% Critical H Value (KM-Log)	9.807
KM Standard Error of Mean (logged)	1.146	95% H-UCL (KM -Log)	12922
KM SD (logged)	2.092	95% Critical H Value (KM-Log)	9.807
KM Standard Error of Mean (logged)	1.146		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.546	Mean in Log Scale	-2.729
SD in Original Scale	1.148	SD in Log Scale	2.164
95% t UCL (Assumes normality)	1.641	95% H-Stat UCL	39357

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	1.744

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

4,4'-DDT (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	6	Number of Non-Detects	1
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	0.14	Minimum Non-Detect	0.046
Maximum Detect	11	Maximum Non-Detect	0.046
Variance Detects	17.69	Percent Non-Detects	14.29%
Mean Detects	2.69	SD Detects	4.206
Median Detects	0.695	CV Detects	1.564
Skewness Detects	2.141	Kurtosis Detects	4.634
Mean of Logged Detects	0.0256	SD of Logged Detects	1.525

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.674	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.344	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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

KM Mean	2.312	KM Standard Error of Mean	1.521
KM SD	3.673	95% KM (BCA) UCL	4.945
95% KM (t) UCL	5.267	95% KM (Percentile Bootstrap) UCL	4.992
95% KM (z) UCL	4.814	95% KM Bootstrap t UCL	28.65
90% KM Chebyshev UCL	6.875	95% KM Chebyshev UCL	8.941
97.5% KM Chebyshev UCL	11.81	99% KM Chebyshev UCL	17.44

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.475	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.317	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.346	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)	0.636	k star (bias corrected MLE)	0.429
Theta hat (MLE)	4.232	Theta star (bias corrected MLE)	6.272
nu hat (MLE)	7.627	nu star (bias corrected)	5.147

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean (detects)	2.69

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.307
Maximum	11	Median	0.63
SD	3.971	CV	1.721
k hat (MLE)	0.44	k star (bias corrected MLE)	0.347
Theta hat (MLE)	5.241	Theta star (bias corrected MLE)	6.653
nu hat (MLE)	6.163	nu star (bias corrected)	4.855
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (4.86, α)	1.086	Adjusted Chi Square Value (4.86, β)	0.644
95% Gamma Approximate UCL (use when n>=50)	10.32	95% Gamma Adjusted UCL (use when n<50)	17.38

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.312	SD (KM)	3.673
Variance (KM)	13.49	SE of Mean (KM)	1.521
k hat (KM)	0.396	k star (KM)	0.322
nu hat (KM)	5.548	nu star (KM)	4.504
theta hat (KM)	5.835	theta star (KM)	7.188
80% gamma percentile (KM)	3.603	90% gamma percentile (KM)	6.759
95% gamma percentile (KM)	10.34	99% gamma percentile (KM)	19.57

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.50, α)	0.93	Adjusted Chi Square Value (4.50, β)	0.537
95% Gamma Approximate KM-UCL (use when n>=50)	11.2	95% Gamma Adjusted KM-UCL (use when n<50)	19.39

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.245	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	2.309	Mean in Log Scale	-0.521
SD in Original Scale	3.97	SD in Log Scale	2.008
95% t UCL (assumes normality of ROS data)	5.224	95% Percentile Bootstrap UCL	5.04
95% BCA Bootstrap UCL	5.729	95% Bootstrap t UCL	29.78
95% H-UCL (Log ROS)	1149		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.418	KM Geo Mean	0.658

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM SD (logged)	1.686	95% Critical H Value (KM-Log)	5.759
KM Standard Error of Mean (logged)	0.698	95% H-UCL (KM -Log)	143.6
KM SD (logged)	1.686	95% Critical H Value (KM-Log)	5.759
KM Standard Error of Mean (logged)	0.698		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.309	Mean in Log Scale	-0.517
SD in Original Scale	3.97	SD in Log Scale	2
95% t UCL (Assumes normality)	5.224	95% H-Stat UCL	1087

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 Bootstrap t UCL 28.65 ı Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 19.39

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 (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	2	Number of Non-Detects	3
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	0.029	Minimum Non-Detect	0.0087
Maximum Detect	0.19	Maximum Non-Detect	0.042
Variance Detects	0.013	Percent Non-Detects	60%
Mean Detects	0.11	SD Detects	0.114
Median Detects	0.11	CV Detects	1.04
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.601	SD of Logged Detects	1.329

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0504	KM Standard Error of Mean	0.0446
KM SD	0.0703	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.145	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.124	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.184	95% KM Chebyshev UCL	0.245
97.5% KM Chebyshev UCL	0.329	99% KM Chebyshev UCL	0.494

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.43	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0766	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.72	nu star (bias corrected)	N/A
Mean (detects)	0.11		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0504	SD (KM)	0.0703
Variance (KM)	0.00495	SE of Mean (KM)	0.0446
k hat (KM)	0.513	k star (KM)	0.338
nu hat (KM)	5.129	nu star (KM)	3.385
theta hat (KM)	0.0982	theta star (KM)	0.149
80% gamma percentile (KM)	0.0793	90% gamma percentile (KM)	0.146
95% gamma percentile (KM)	0.222	99% gamma percentile (KM)	0.414

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0086
Approximate Chi Square Value (3.38, α)	0.495	Adjusted Chi Square Value (3.38, β)	0.19
95% Gamma Approximate KM-UCL (use when n>=50)	0.344	95% Gamma Adjusted KM-UCL (use when n<50)	0.899

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	0.0462	Mean in Log Scale	-4.398
SD in Original Scale	0.0811	SD in Log Scale	1.801
95% t UCL (assumes normality of ROS data)	0.124	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	129.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.807	KM Geo Mean	0.0222
KM SD (logged)	1.187	95% Critical H Value (KM-Log)	5.721
KM Standard Error of Mean (logged)	0.773	95% H-UCL (KM -Log)	1.341

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM SD (logged)	1.187	95% Critical H Value (KM-Log)	5.721
KM Standard Error of Mean (logged)	0.773		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.051	Mean in Log Scale	-3.812
SD in Original Scale	0.0783	SD in Log Scale	1.405
95% t UCL (Assumes normality)	0.126	95% H-Stat UCL	6.553

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 (Chebyshev) UCL 0.245

Warning: Recommended UCL exceeds the maximum observation

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 (so-15)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Number of Detects	2	Number of Non-Detects	1
Number of Distinct Detects	2	Number of Distinct Non-Detects	1
Minimum Detect	0.012	Minimum Non-Detect	0.0046
Maximum Detect	0.059	Maximum Non-Detect	0.0046
Variance Detects	0.0011	Percent Non-Detects	33.33%
Mean Detects	0.0355	SD Detects	0.0332
Median Detects	0.0355	CV Detects	0.936
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-3.627	SD of Logged Detects	1.126

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0252	KM Standard Error of Mean	0.0197
KM SD	0.0241	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0826	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0576	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0842	95% KM Chebyshev UCL	0.111
97.5% KM Chebyshev UCL	0.148	99% KM Chebyshev UCL	0.221

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.884	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0188	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.535	nu star (bias corrected)	N/A
Mean (detects)	0.0355		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0252	SD (KM)	0.0241
Variance (KM)	5.8035E-4	SE of Mean (KM)	0.0197
k hat (KM)	1.094	k star (KM)	N/A
nu hat (KM)	6.565	nu star (KM)	N/A
theta hat (KM)	0.023	theta star (KM)	N/A
80% gamma percentile (KM)	N/A	90% gamma percentile (KM)	N/A
95% gamma percentile (KM)	N/A	99% gamma percentile (KM)	N/A

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.00136
Approximate Chi Square Value (N/A, α)	N/A	Adjusted Chi Square Value (N/A, β)	N/A
95% Gamma Approximate KM-UCL (use when n>=50)	N/A	95% Gamma Adjusted KM-UCL (use when n<50)	N/A

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	0.0239	Mean in Log Scale	-4.832
SD in Original Scale	0.0309	SD in Log Scale	2.235
95% t UCL (assumes normality of ROS data)	0.076	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	1.105E+19		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.212	KM Geo Mean	0.0148
KM SD (logged)	1.052	95% Critical H Value (KM-Log)	13.74
KM Standard Error of Mean (logged)	0.859	95% H-UCL (KM -Log)	708

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM SD (logged)	1.052	95% Critical H Value (KM-Log)	13.74
KM Standard Error of Mean (logged)	0.859		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0244	Mean in Log Scale	-4.443
SD in Original Scale	0.0303	SD in Log Scale	1.622
95% t UCL (Assumes normality)	0.0756	95% H-Stat UCL	1.604E+9

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 (Chebyshev) UCL 0.111

Warning: Recommended UCL exceeds the maximum observation

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 (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.064	Minimum Non-Detect	0.042
Maximum Detect	1.1	Maximum Non-Detect	0.045
Variance Detects	0.231	Percent Non-Detects	33.33%
Mean Detects	0.481	SD Detects	0.481
Median Detects	0.38	CV Detects	0.999
Skewness Detects	0.767	Kurtosis Detects	-1.56
Mean of Logged Detects	-1.274	SD of Logged Detects	1.312

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.261	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.335	KM Standard Error of Mean	0.188
KM SD	0.398	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.713	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.643	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.897	95% KM Chebyshev UCL	1.152
97.5% KM Chebyshev UCL	1.506	99% KM Chebyshev UCL	2.201

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.298	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.666	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.26	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.402	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)	1.057	k star (bias corrected MLE)	0.431
Theta hat (MLE)	0.455	Theta star (bias corrected MLE)	1.116
nu hat (MLE)	8.457	nu star (bias corrected)	3.448
Mean (detects)	0.481		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.324
Maximum	1.1	Median	0.102
SD	0.445	CV	1.372
k hat (MLE)	0.504	k star (bias corrected MLE)	0.363
Theta hat (MLE)	0.642	Theta star (bias corrected MLE)	0.892
nu hat (MLE)	6.052	nu star (bias corrected)	4.36
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (4.36, α)	0.869	Adjusted Chi Square Value (4.36, β)	0.44
95% Gamma Approximate UCL (use when n>=50)	1.626	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.335	SD (KM)	0.398
Variance (KM)	0.158	SE of Mean (KM)	0.188
k hat (KM)	0.708	k star (KM)	0.465
nu hat (KM)	8.492	nu star (KM)	5.579
theta hat (KM)	0.473	theta star (KM)	0.72
80% gamma percentile (KM)	0.547	90% gamma percentile (KM)	0.919
95% gamma percentile (KM)	1.319	99% gamma percentile (KM)	2.311

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.58, α)	1.429	Adjusted Chi Square Value (5.58, β)	0.804
95% Gamma Approximate KM-UCL (use when n>=50)	1.307	95% Gamma Adjusted KM-UCL (use when n<50)	2.322

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.941	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.228	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.323	Mean in Log Scale	-2.476
SD in Original Scale	0.445	SD in Log Scale	2.12
95% t UCL (assumes normality of ROS data)	0.69	95% Percentile Bootstrap UCL	0.607
95% BCA Bootstrap UCL	0.678	95% Bootstrap t UCL	2.217
95% H-UCL (Log ROS)	1795		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.906	KM Geo Mean	0.149
KM SD (logged)	1.288	95% Critical H Value (KM-Log)	5.124
KM Standard Error of Mean (logged)	0.607	95% H-UCL (KM -Log)	6.518
KM SD (logged)	1.288	95% Critical H Value (KM-Log)	5.124
KM Standard Error of Mean (logged)	0.607		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.328	Mean in Log Scale	-2.126
SD in Original Scale	0.441	SD in Log Scale	1.665
95% t UCL (Assumes normality)	0.691	95% H-Stat UCL	59.38

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 0.713

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 (so-17)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.014	Minimum Non-Detect	0.0092
Maximum Detect	8	Maximum Non-Detect	0.48
Variance Detects	15.85	Percent Non-Detects	50%
Mean Detects	2.029	SD Detects	3.981
Median Detects	0.051	CV Detects	1.962
Skewness Detects	2	Kurtosis Detects	3.999
Mean of Logged Detects	-2.055	SD of Logged Detects	2.828

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.635	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.439	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	1.024	KM Standard Error of Mean	1.076
KM SD	2.637	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.063	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.795	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	4.253	95% KM Chebyshev UCL	5.716
97.5% KM Chebyshev UCL	7.747	99% KM Chebyshev UCL	11.73

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.678	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.428	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.421	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.256	k star (bias corrected MLE)	0.231
Theta hat (MLE)	7.922	Theta star (bias corrected MLE)	8.795
nu hat (MLE)	2.049	nu star (bias corrected)	1.846
Mean (detects)	2.029		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.02
Maximum	8	Median	0.012
SD	2.821	CV	2.767
k hat (MLE)	0.217	k star (bias corrected MLE)	0.219
Theta hat (MLE)	4.7	Theta star (bias corrected MLE)	4.657
nu hat (MLE)	3.471	nu star (bias corrected)	3.503
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (3.50, α)	0.536	Adjusted Chi Square Value (3.50, β)	0.316
95% Gamma Approximate UCL (use when n>=50)	6.666	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.024	SD (KM)	2.637
Variance (KM)	6.953	SE of Mean (KM)	1.076
k hat (KM)	0.151	k star (KM)	0.178
nu hat (KM)	2.413	nu star (KM)	2.841
theta hat (KM)	6.79	theta star (KM)	5.766
80% gamma percentile (KM)	1.26	90% gamma percentile (KM)	3.086
95% gamma percentile (KM)	5.434	99% gamma percentile (KM)	12.03

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.84, α)	0.327	Adjusted Chi Square Value (2.84, β)	0.188
95% Gamma Approximate KM-UCL (use when n>=50)	8.897	95% Gamma Adjusted KM-UCL (use when n<50)	15.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.345	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	1.017	Mean in Log Scale	-4.007
SD in Original Scale	2.822	SD in Log Scale	2.988
95% t UCL (assumes normality of ROS data)	2.907	95% Percentile Bootstrap UCL	3.007
95% BCA Bootstrap UCL	4.011	95% Bootstrap t UCL	241.4
95% H-UCL (Log ROS)	39806		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.147	KM Geo Mean	0.043
KM SD (logged)	2.098	95% Critical H Value (KM-Log)	6.413
KM Standard Error of Mean (logged)	0.877	95% H-UCL (KM -Log)	62.83
KM SD (logged)	2.098	95% Critical H Value (KM-Log)	6.413
KM Standard Error of Mean (logged)	0.877		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.076	Mean in Log Scale	-2.618
SD in Original Scale	2.799	SD in Log Scale	2.363
95% t UCL (Assumes normality)	2.951	95% H-Stat UCL	720.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL N/A ı Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 15.5

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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 (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	3	Number of Non-Detects	4
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.16	Minimum Non-Detect	0.0041
Maximum Detect	6.5	Maximum Non-Detect	0.45
Variance Detects	12.44	Percent Non-Detects	57.14%
Mean Detects	2.437	SD Detects	3.527
Median Detects	0.65	CV Detects	1.448
Skewness Detects	1.695	Kurtosis Detects	N/A
Mean of Logged Detects	-0.131	SD of Logged Detects	1.87

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk GOF Test**	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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

KM Mean	1.052	KM Standard Error of Mean	1.035
KM SD	2.235	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.062	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.754	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	4.156	95% KM Chebyshev UCL	5.562
97.5% KM Chebyshev UCL	7.513	99% KM Chebyshev UCL	11.35

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.604	k star (bias corrected MLE)	N/A
Theta hat (MLE)	4.031	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.627	nu star (bias corrected)	N/A
Mean (detects)	2.437		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.05
Maximum	6.5	Median	0.01
SD	2.415	CV	2.3
k hat (MLE)	0.258	k star (bias corrected MLE)	0.243
Theta hat (MLE)	4.066	Theta star (bias corrected MLE)	4.325
nu hat (MLE)	3.615	nu star (bias corrected)	3.399
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (3.40, α)	0.5	Adjusted Chi Square Value (3.40, β)	0.263
95% Gamma Approximate UCL (use when n>=50)	7.14	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.052	SD (KM)	2.235
Variance (KM)	4.994	SE of Mean (KM)	1.035
k hat (KM)	0.222	k star (KM)	0.222
nu hat (KM)	3.104	nu star (KM)	3.107
theta hat (KM)	4.746	theta star (KM)	4.741
80% gamma percentile (KM)	1.458	90% gamma percentile (KM)	3.178
95% gamma percentile (KM)	5.271	99% gamma percentile (KM)	10.94

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.11, α)	0.405	Adjusted Chi Square Value (3.11, β)	0.209
95% Gamma Approximate KM-UCL (use when n>=50)	8.076	95% Gamma Adjusted KM-UCL (use when n<50)	15.64

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	1.048	Mean in Log Scale	-3.057
SD in Original Scale	2.416	SD in Log Scale	2.961
95% t UCL (assumes normality of ROS data)	2.822	95% Percentile Bootstrap UCL	2.811
95% BCA Bootstrap UCL	3.738	95% Bootstrap t UCL	33
95% H-UCL (Log ROS)	538127		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.066	KM Geo Mean	0.0466
KM SD (logged)	2.813	95% Critical H Value (KM-Log)	9.342
KM Standard Error of Mean (logged)	1.339	95% H-UCL (KM -Log)	111097
KM SD (logged)	2.813	95% Critical H Value (KM-Log)	9.342
KM Standard Error of Mean (logged)	1.339		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.077	Mean in Log Scale	-2.902
SD in Original Scale	2.402	SD in Log Scale	3.255
95% t UCL (Assumes normality)	2.842	95% H-Stat UCL	17902318

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	3.062

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 Data Sets with Non-Detects

User Selected Options
Date/Time of Computation ProUCL 5.17/10/2018 1:03:06 PM

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDE (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.38	Minimum Non-Detect	0.21
Maximum Detect	1	Maximum Non-Detect	0.21
Variance Detects	0.0726	Percent Non-Detects	20%
Mean Detects	0.615	SD Detects	0.27
Median Detects	0.54	CV Detects	0.438
Skewness Detects	1.448	Kurtosis Detects	2.42
Mean of Logged Detects	-0.551	SD of Logged Detects	0.407

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.302	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.534	KM Standard Error of Mean	0.136
KM SD	0.264	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.825	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.758	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.943	95% KM Chebyshev UCL	1.129
97.5% KM Chebyshev UCL	1.386	99% KM Chebyshev UCL	1.892

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.313	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.658	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.267	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.395	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	7.828	k star (bias corrected MLE)	2.124
Theta hat (MLE)	0.0786	Theta star (bias corrected MLE)	0.29
nu hat (MLE)	62.62	nu star (bias corrected)	16.99
Mean (detects)	0.615		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0275	Mean	0.497
Maximum	1	Median	0.5
SD	0.351	CV	0.706
k hat (MLE)	1.223	k star (bias corrected MLE)	0.622
Theta hat (MLE)	0.407	Theta star (bias corrected MLE)	0.799
nu hat (MLE)	12.23	nu star (bias corrected)	6.224
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (6.22, α)	1.756	Adjusted Chi Square Value (6.22, β)	0.91
95% Gamma Approximate UCL (use when n>=50)	1.764	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.534	SD (KM)	0.264
Variance (KM)	0.0698	SE of Mean (KM)	0.136
k hat (KM)	4.084	k star (KM)	1.767
nu hat (KM)	40.84	nu star (KM)	17.67
theta hat (KM)	0.131	theta star (KM)	0.302
80% gamma percentile (KM)	0.811	90% gamma percentile (KM)	1.07
95% gamma percentile (KM)	1.318	99% gamma percentile (KM)	1.873

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.67, α)	9.152	Adjusted Chi Square Value (17.67, β)	6.643
95% Gamma Approximate KM-UCL (use when n>=50)	1.031	95% Gamma Adjusted KM-UCL (use when n<50)	1.42

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.531	Mean in Log Scale	-0.768
SD in Original Scale	0.3	SD in Log Scale	0.599
95% t UCL (assumes normality of ROS data)	0.817	95% Percentile Bootstrap UCL	0.732
95% BCA Bootstrap UCL	0.752	95% Bootstrap t UCL	0.903

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% H-UCL (Log ROS)	1.484

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.753	KM Geo Mean	0.471
KM SD (logged)	0.512	95% Critical H Value (KM-Log)	2.986
KM Standard Error of Mean (logged)	0.265	95% H-UCL (KM -Log)	1.154
KM SD (logged)	0.512	95% Critical H Value (KM-Log)	2.986
KM Standard Error of Mean (logged)	0.265		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.513	Mean in Log Scale	-0.892
SD in Original Scale	0.326	SD in Log Scale	0.839
95% t UCL (Assumes normality)	0.824	95% H-Stat UCL	3.427

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	0.825

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'-DDE (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Minimum	0.12	Mean	0.12
Maximum	0.12	Median	0.12

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable 4,4'-DDE (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

4,4'-DDE (so-03)

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Minimum	0.074	Mean	0.449
Maximum	0.82	Median	0.42
SD	0.355	Std. Error of Mean	0.159
Coefficient of Variation	0.791	Skewness	0.0875

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.239	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	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	0.787	95% Adjusted-CLT UCL (Chen-1995)	0.717
		95% Modified-t UCL (Johnson-1978)	0.788

Gamma GOF Test

A-D Test Statistic	0.411	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.687	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.25	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.362	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.441	k star (bias corrected MLE)	0.71
Theta hat (MLE)	0.311	Theta star (bias corrected MLE)	0.632
nu hat (MLE)	14.41	nu star (bias corrected)	7.098
MLE Mean (bias corrected)	0.449	MLE Sd (bias corrected)	0.533
		Approximate Chi Square Value (0.05)	2.225
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	1.224

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.432	95% Adjusted Gamma UCL (use when n<50)	2.602

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.215	**Lilliefors Lognormal GOF Test**

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.604	Mean of logged Data	-1.187
Maximum of Logged Data	-0.198	SD of logged Data	1.089

Assuming Lognormal Distribution

95% H-UCL	9.843	90% Chebyshev (MVUE) UCL	1.134
95% Chebyshev (MVUE) UCL	1.432	97.5% Chebyshev (MVUE) UCL	1.847
99% Chebyshev (MVUE) UCL	2.661		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.71	95% Jackknife UCL	0.787
95% Standard Bootstrap UCL	0.683	95% Bootstrap-t UCL	0.891
95% Hall's Bootstrap UCL	0.609	95% Percentile Bootstrap UCL	0.674
95% BCA Bootstrap UCL	0.678		
90% Chebyshev(Mean, Sd) UCL	0.925	95% Chebyshev(Mean, Sd) UCL	1.141
97.5% Chebyshev(Mean, Sd) UCL	1.44	99% Chebyshev(Mean, Sd) UCL	2.028

Suggested UCL to Use

95% Student's-t UCL	0.787

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'-DDE (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Minimum	0.5	Mean	0.565
Maximum	0.63	Median	0.565

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable 4,4'-DDE (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

4,4'-DDE (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.092	Minimum Non-Detect	0.044
Maximum Detect	2.8	Maximum Non-Detect	0.044
Variance Detects	0.689	Percent Non-Detects	9.091%
Mean Detects	0.834	SD Detects	0.83
Median Detects	0.75	CV Detects	0.995
Skewness Detects	1.534	Kurtosis Detects	3.008
Mean of Logged Detects	-0.744	SD of Logged Detects	1.238

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.825	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	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

KM Mean	0.762	KM Standard Error of Mean	0.249
KM SD	0.784	95% KM (BCA) UCL	1.191
95% KM (t) UCL	1.214	95% KM (Percentile Bootstrap) UCL	1.185
95% KM (z) UCL	1.172	95% KM Bootstrap t UCL	1.451
90% KM Chebyshev UCL	1.51	95% KM Chebyshev UCL	1.849
97.5% KM Chebyshev UCL	2.319	99% KM Chebyshev UCL	3.243

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.465	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.748	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.181	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.274	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)	1.023	k star (bias corrected MLE)	0.783
Theta hat (MLE)	0.815	Theta star (bias corrected MLE)	1.065
nu hat (MLE)	20.47	nu star (bias corrected)	15.66
Mean (detects)	0.834		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.759
Maximum	2.8	Median	0.67
SD	0.826	CV	1.088
k hat (MLE)	0.733	k star (bias corrected MLE)	0.594
Theta hat (MLE)	1.036	Theta star (bias corrected MLE)	1.279
nu hat (MLE)	16.12	nu star (bias corrected)	13.06
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (13.06, α)	5.933	Adjusted Chi Square Value (13.06, β)	5.17
95% Gamma Approximate UCL (use when n>=50)	1.671	95% Gamma Adjusted UCL (use when n<50)	1.917

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.762	SD (KM)	0.784
Variance (KM)	0.615	SE of Mean (KM)	0.249
k hat (KM)	0.944	k star (KM)	0.747
nu hat (KM)	20.77	nu star (KM)	16.44
theta hat (KM)	0.807	theta star (KM)	1.02
80% gamma percentile (KM)	1.25	90% gamma percentile (KM)	1.884
95% gamma percentile (KM)	2.534	99% gamma percentile (KM)	4.077

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (16.44, α)	8.275	Adjusted Chi Square Value (16.44, β)	7.349
95% Gamma Approximate KM-UCL (use when n>=50)	1.514	95% Gamma Adjusted KM-UCL (use when n<50)	1.705

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	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	0.76	Mean in Log Scale	-1.012
SD in Original Scale	0.824	SD in Log Scale	1.473
95% t UCL (assumes normality of ROS data)	1.211	95% Percentile Bootstrap UCL	1.185
95% BCA Bootstrap UCL	1.283	95% Bootstrap t UCL	1.404
95% H-UCL (Log ROS)	6.842		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.96	KM Geo Mean	0.383
KM SD (logged)	1.312	95% Critical H Value (KM-Log)	3.63
KM Standard Error of Mean (logged)	0.417	95% H-UCL (KM -Log)	4.082
KM SD (logged)	1.312	95% Critical H Value (KM-Log)	3.63
KM Standard Error of Mean (logged)	0.417		

DL/2 Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.76	Mean in Log Scale	-1.023
SD in Original Scale	0.825	SD in Log Scale	1.496
95% t UCL (Assumes normality)	1.211	95% H-Stat UCL	7.38

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 1.214

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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'-DDE (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	0.35	Mean	1.283
Maximum	2.4	Median	1.1
SD	1.037	Std. Error of Mean	0.599
Coefficient of Variation	0.808	Skewness	0.771

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.237	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	3.032	95% Adjusted-CLT UCL (Chen-1995)	2.553
		95% Modified-t UCL (Johnson-1978)	3.076

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1.963	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.654	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11.78	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.988	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.217	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.05	Mean of logged Data	-0.0263
Maximum of Logged Data	0.875	SD of logged Data	0.968

Assuming Lognormal Distribution

95% H-UCL	8912	90% Chebyshev (MVUE) UCL	3.268
95% Chebyshev (MVUE) UCL	4.158	97.5% Chebyshev (MVUE) UCL	5.393
99% Chebyshev (MVUE) UCL	7.819		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	2.268	95% Jackknife UCL	3.032
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	3.08	95% Chebyshev(Mean, Sd) UCL	3.894
97.5% Chebyshev(Mean, Sd) UCL	5.023	99% Chebyshev(Mean, Sd) UCL	7.242

Suggested UCL to Use

95% Student's-t UCL 3.032

Recommended UCL exceeds the maximum observation

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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'-DDE (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	4	Number of Non-Detects	3
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.093	Minimum Non-Detect	0.024
Maximum Detect	1.8	Maximum Non-Detect	0.45
Variance Detects	0.585	Percent Non-Detects	42.86%
Mean Detects	0.741	SD Detects	0.765
Median Detects	0.535	CV Detects	1.033
Skewness Detects	1.219	Kurtosis Detects	0.894
Mean of Logged Detects	-0.824	SD of Logged Detects	1.284

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.445	KM Standard Error of Mean	0.266
KM SD	0.608	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.962	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.883	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.243	95% KM Chebyshev UCL	1.605
97.5% KM Chebyshev UCL	2.107	99% KM Chebyshev UCL	3.092

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.21	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.666	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.203	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.402	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	1.091	k star (bias corrected MLE)	0.439
Theta hat (MLE)	0.679	Theta star (bias corrected MLE)	1.686
nu hat (MLE)	8.727	nu star (bias corrected)	3.515
Mean (detects)	0.741		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.428
Maximum	1.8	Median	0.093
SD	0.667	CV	1.561
k hat (MLE)	0.411	k star (bias corrected MLE)	0.33
Theta hat (MLE)	1.041	Theta star (bias corrected MLE)	1.296
nu hat (MLE)	5.752	nu star (bias corrected)	4.62
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (4.62, α)	0.981	Adjusted Chi Square Value (4.62, β)	0.572
95% Gamma Approximate UCL (use when n>=50)	2.014	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.445	SD (KM)	0.608
Variance (KM)	0.37	SE of Mean (KM)	0.266
k hat (KM)	0.536	k star (KM)	0.402
nu hat (KM)	7.507	nu star (KM)	5.623
theta hat (KM)	0.83	theta star (KM)	1.108
80% gamma percentile (KM)	0.719	90% gamma percentile (KM)	1.257
95% gamma percentile (KM)	1.847	99% gamma percentile (KM)	3.331

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.62, α)	1.45	Adjusted Chi Square Value (5.62, β)	0.906
95% Gamma Approximate KM-UCL (use when n>=50)	1.726	95% Gamma Adjusted KM-UCL (use when n<50)	2.763

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.987	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.438	Mean in Log Scale	-1.993
SD in Original Scale	0.66	SD in Log Scale	1.759
95% t UCL (assumes normality of ROS data)	0.923	95% Percentile Bootstrap UCL	0.869
95% BCA Bootstrap UCL	1.04	95% Bootstrap t UCL	2.365

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% H-UCL (Log ROS)	47.19

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.933	KM Geo Mean	0.145
KM SD (logged)	1.608	95% Critical H Value (KM-Log)	5.516
KM Standard Error of Mean (logged)	0.727	95% H-UCL (KM -Log)	19.69
KM SD (logged)	1.608	95% Critical H Value (KM-Log)	5.516
KM Standard Error of Mean (logged)	0.727		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.463	Mean in Log Scale	-1.762
SD in Original Scale	0.646	SD in Log Scale	1.707
95% t UCL (Assumes normality)	0.938	95% H-Stat UCL	42.58

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	0.962

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'-DDE (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	0.12	Mean	0.731
Maximum	1.7	Median	0.62
SD	0.514	Std. Error of Mean	0.194
Coefficient of Variation	0.702	Skewness	1.07

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.185	**Lilliefors GOF Test**	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Lilliefors Critical Value	0.304	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	1.109	95% Adjusted-CLT UCL (Chen-1995)	1.135
		95% Modified-t UCL (Johnson-1978)	1.122

Gamma GOF Test

A-D Test Statistic	0.173	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.715	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.152	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.315	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.096	k star (bias corrected MLE)	1.293
Theta hat (MLE)	0.349	Theta star (bias corrected MLE)	0.566
nu hat (MLE)	29.34	nu star (bias corrected)	18.1
MLE Mean (bias corrected)	0.731	MLE Sd (bias corrected)	0.643
		Approximate Chi Square Value (0.05)	9.463
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	7.653

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.399	95% Adjusted Gamma UCL (use when n<50)	1.73

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.201	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.12	Mean of logged Data	-0.57
Maximum of Logged Data	0.531	SD of logged Data	0.852

Assuming Lognormal Distribution

95% H-UCL	2.551	90% Chebyshev (MVUE) UCL	1.505
95% Chebyshev (MVUE) UCL	1.841	97.5% Chebyshev (MVUE) UCL	2.307
99% Chebyshev (MVUE) UCL	3.223		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.051	95% Jackknife UCL	1.109

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% Standard Bootstrap UCL	1.023	95% Bootstrap-t UCL	1.254
95% Hall's Bootstrap UCL	1.554	95% Percentile Bootstrap UCL	1.033
95% BCA Bootstrap UCL	1.081		
90% Chebyshev(Mean, Sd) UCL	1.314	95% Chebyshev(Mean, Sd) UCL	1.578
97.5% Chebyshev(Mean, Sd) UCL	1.944	99% Chebyshev(Mean, Sd) UCL	2.663

Suggested UCL to Use

95% Student's-t UCL 1.109

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'-DDE (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.036	Minimum Non-Detect	4.4
Maximum Detect	1	Maximum Non-Detect	4.4
Variance Detects	0.219	Percent Non-Detects	20%
Mean Detects	0.3	SD Detects	0.468
Median Detects	0.0825	CV Detects	1.557
Skewness Detects	1.973	Kurtosis Detects	3.907
Mean of Logged Detects	-2.108	SD of Logged Detects	1.479

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.688	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.408	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.3	KM Standard Error of Mean	0.234
KM SD	0.405	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.799	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.685	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.002	95% KM Chebyshev UCL	1.319

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

97.5% KM Chebyshev UCL	1.76	99% KM Chebyshev UCL	2.626

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.548	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.674	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.358	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.407	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)	0.672	k star (bias corrected MLE)	0.335
Theta hat (MLE)	0.447	Theta star (bias corrected MLE)	0.897
nu hat (MLE)	5.374	nu star (bias corrected)	2.677
Mean (detects)	0.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.036	Mean	0.278
Maximum	1	Median	0.11
SD	0.408	CV	1.469
k hat (MLE)	0.802	k star (bias corrected MLE)	0.454
Theta hat (MLE)	0.346	Theta star (bias corrected MLE)	0.612
nu hat (MLE)	8.019	nu star (bias corrected)	4.541
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (4.54, α)	0.946	Adjusted Chi Square Value (4.54, β)	0.417
95% Gamma Approximate UCL (use when n>=50)	1.333	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.3	SD (KM)	0.405
Variance (KM)	0.164	SE of Mean (KM)	0.234
k hat (KM)	0.55	k star (KM)	0.353
nu hat (KM)	5.498	nu star (KM)	3.533
theta hat (KM)	0.546	theta star (KM)	0.85
80% gamma percentile (KM)	0.476	90% gamma percentile (KM)	0.866
95% gamma percentile (KM)	1.302	99% gamma percentile (KM)	2.412

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.53, α)	0.546	Adjusted Chi Square Value (3.53, β)	0.213
95% Gamma Approximate KM-UCL (use when n>=50)	1.942	95% Gamma Adjusted KM-UCL (use when n<50)	4.991

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.878	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lilliefors Test Statistic	0.277	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.264	Mean in Log Scale	-2.108
SD in Original Scale	0.413	SD in Log Scale	1.281
95% t UCL (assumes normality of ROS data)	0.658	95% Percentile Bootstrap UCL	0.618
95% BCA Bootstrap UCL	0.635	95% Bootstrap t UCL	2.968
95% H-UCL (Log ROS)	14.04		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.108	KM Geo Mean	0.121
KM SD (logged)	1.281	95% Critical H Value (KM-Log)	6.137
KM Standard Error of Mean (logged)	0.739	95% H-UCL (KM -Log)	14.04
KM SD (logged)	1.281	95% Critical H Value (KM-Log)	6.137
KM Standard Error of Mean (logged)	0.739		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.68	Mean in Log Scale	-1.529
SD in Original Scale	0.941	SD in Log Scale	1.822
95% t UCL (Assumes normality)	1.577	95% H-Stat UCL	2807

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 Bootstrap t UCL	N/A	Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	4.991

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'-DDE (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	3	Number of Non-Detects	5
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.49	Minimum Non-Detect	0.041
Maximum Detect	0.67	Maximum Non-Detect	0.22
Variance Detects	0.0102	Percent Non-Detects	62.5%
Mean Detects	0.607	SD Detects	0.101
Median Detects	0.66	CV Detects	0.167

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Skewness Detects	-1.713	Kurtosis Detects	N/A
Mean of Logged Detects	-0.51	SD of Logged Detects	0.176

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.368	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.253	KM Standard Error of Mean	0.121
KM SD	0.278	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.482	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.451	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.615	95% KM Chebyshev UCL	0.779
97.5% KM Chebyshev UCL	1.006	99% KM Chebyshev UCL	1.453

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	50.14	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0121	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	300.8	nu star (bias corrected)	N/A
Mean (detects)	0.607		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.304	Mean	0.417
Maximum	0.67	Median	0.304
SD	0.166	CV	0.398
k hat (MLE)	8.205	k star (bias corrected MLE)	5.212
Theta hat (MLE)	0.0508	Theta star (bias corrected MLE)	0.0801

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

nu hat (MLE)	131.3	nu star (bias corrected)	83.39
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (83.39, α)	63.34	Adjusted Chi Square Value (83.39, β)	58.94
95% Gamma Approximate UCL (use when n>=50)	0.549	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.253	SD (KM)	0.278
Variance (KM)	0.0776	SE of Mean (KM)	0.121
k hat (KM)	0.826	k star (KM)	0.6
nu hat (KM)	13.22	nu star (KM)	9.595
theta hat (KM)	0.306	theta star (KM)	0.422
80% gamma percentile (KM)	0.417	90% gamma percentile (KM)	0.658
95% gamma percentile (KM)	0.911	99% gamma percentile (KM)	1.522

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.60, α)	3.69	Adjusted Chi Square Value (9.60, β)	2.825
95% Gamma Approximate KM-UCL (use when n>=50)	0.658	95% Gamma Adjusted KM-UCL (use when n<50)	0.86

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.786	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.37	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.441	Mean in Log Scale	-0.863
SD in Original Scale	0.148	SD in Log Scale	0.307
95% t UCL (assumes normality of ROS data)	0.54	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.562		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.188	KM Geo Mean	0.112
KM SD (logged)	1.303	95% Critical H Value (KM-Log)	4.207
KM Standard Error of Mean (logged)	0.564	95% H-UCL (KM -Log)	2.079
KM SD (logged)	1.303	95% Critical H Value (KM-Log)	4.207
KM Standard Error of Mean (logged)	0.564		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.258	Mean in Log Scale	-2.207
SD in Original Scale	0.295	SD in Log Scale	1.495
95% t UCL (Assumes normality)	0.455	95% H-Stat UCL	4.85

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.482

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'-DDE (so-11)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Minimum	0.07	Mean	0.303
Maximum	0.99	Median	0.13
SD	0.361	Std. Error of Mean	0.147
Coefficient of Variation	1.192	Skewness	1.85

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.736	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.321	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	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	0.6	95% Adjusted-CLT UCL (Chen-1995)	0.665
		95% Modified-t UCL (Johnson-1978)	0.619

Gamma GOF Test

A-D Test Statistic	0.535	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.713	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.276	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.34	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.118	k star (bias corrected MLE)	0.67

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Theta hat (MLE)	0.271	Theta star (bias corrected MLE)	0.452
nu hat (MLE)	13.42	nu star (bias corrected)	8.041
MLE Mean (bias corrected)	0.303	MLE Sd (bias corrected)	0.37
		Approximate Chi Square Value (0.05)	2.759
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	1.772

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.883	95% Adjusted Gamma UCL (use when n<50)	1.375

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.215	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.659	Mean of logged Data	-1.704
Maximum of Logged Data	-0.0101	SD of logged Data	1.056

Assuming Lognormal Distribution

95% H-UCL	2.448	90% Chebyshev (MVUE) UCL	0.639
95% Chebyshev (MVUE) UCL	0.801	97.5% Chebyshev (MVUE) UCL	1.025
99% Chebyshev (MVUE) UCL	1.466		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.546	95% Jackknife UCL	0.6
95% Standard Bootstrap UCL	0.526	95% Bootstrap-t UCL	2.114
95% Hall's Bootstrap UCL	2.293	95% Percentile Bootstrap UCL	0.55
95% BCA Bootstrap UCL	0.662		
90% Chebyshev(Mean, Sd) UCL	0.745	95% Chebyshev(Mean, Sd) UCL	0.946
97.5% Chebyshev(Mean, Sd) UCL	1.224	99% Chebyshev(Mean, Sd) UCL	1.77

Suggested UCL to Use

95% Student's-t UCL	0.6

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

4,4'-DDE (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 4,4'-DDE (so-12) was not processed!

4,4'-DDE (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	3	Number of Non-Detects	4
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.069	Minimum Non-Detect	0.046
Maximum Detect	1.6	Maximum Non-Detect	0.49
Variance Detects	0.615	Percent Non-Detects	57.14%
Mean Detects	0.736	SD Detects	0.784
Median Detects	0.54	CV Detects	1.065
Skewness Detects	1.056	Kurtosis Detects	N/A
Mean of Logged Detects	-0.94	SD of Logged Detects	1.597

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.347	KM Standard Error of Mean	0.249

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM SD	0.538	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.831	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.757	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.094	95% KM Chebyshev UCL	1.433
97.5% KM Chebyshev UCL	1.903	99% KM Chebyshev UCL	2.826

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.92	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.801	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.519	nu star (bias corrected)	N/A
Mean (detects)	0.736		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.321
Maximum	1.6	Median	0.01
SD	0.596	CV	1.856
k hat (MLE)	0.354	k star (bias corrected MLE)	0.297
Theta hat (MLE)	0.909	Theta star (bias corrected MLE)	1.081
nu hat (MLE)	4.949	nu star (bias corrected)	4.162
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (4.16, α)	0.787	Adjusted Chi Square Value (4.16, β)	0.441
95% Gamma Approximate UCL (use when n>=50)	1.7	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.347	SD (KM)	0.538
Variance (KM)	0.29	SE of Mean (KM)	0.249
k hat (KM)	0.415	k star (KM)	0.333
nu hat (KM)	5.814	nu star (KM)	4.656
theta hat (KM)	0.835	theta star (KM)	1.043
80% gamma percentile (KM)	0.544	90% gamma percentile (KM)	1.009
95% gamma percentile (KM)	1.534	99% gamma percentile (KM)	2.881

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.66, α)	0.997	Adjusted Chi Square Value (4.66, β)	0.583
95% Gamma Approximate KM-UCL (use when n>=50)	1.62	95% Gamma Adjusted KM-UCL (use when n<50)	2.772

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.325	Mean in Log Scale	-2.804
SD in Original Scale	0.594	SD in Log Scale	2.036
95% t UCL (assumes normality of ROS data)	0.762	95% Percentile Bootstrap UCL	0.705
95% BCA Bootstrap UCL	0.923	95% Bootstrap t UCL	7.141
95% H-UCL (Log ROS)	144.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.075	KM Geo Mean	0.126
KM SD (logged)	1.31	95% Critical H Value (KM-Log)	4.607
KM Standard Error of Mean (logged)	0.614	95% H-UCL (KM -Log)	3.483
KM SD (logged)	1.31	95% Critical H Value (KM-Log)	4.607
KM Standard Error of Mean (logged)	0.614		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.404	Mean in Log Scale	-1.662
SD in Original Scale	0.555	SD in Log Scale	1.386
95% t UCL (Assumes normality)	0.811	95% H-Stat UCL	7.664

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	0.831

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'-DDE (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.011	Minimum Non-Detect	0.021
Maximum Detect	0.68	Maximum Non-Detect	0.042
Variance Detects	0.144	Percent Non-Detects	40%
Mean Detects	0.242	SD Detects	0.379
Median Detects	0.036	CV Detects	1.565

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Skewness Detects	1.724	Kurtosis Detects	N/A
Mean of Logged Detects	-2.74	SD of Logged Detects	2.123

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.778	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.151	KM Standard Error of Mean	0.145
KM SD	0.264	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.46	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.39	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.586	95% KM Chebyshev UCL	0.783
97.5% KM Chebyshev UCL	1.056	99% KM Chebyshev UCL	1.593

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.483	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.502	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.897	nu star (bias corrected)	N/A
Mean (detects)	0.242		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.149
Maximum	0.68	Median	0.011
SD	0.297	CV	1.987
k hat (MLE)	0.413	k star (bias corrected MLE)	0.299
Theta hat (MLE)	0.362	Theta star (bias corrected MLE)	0.5

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

nu hat (MLE)	4.131	nu star (bias corrected)	2.986
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.99, α)	0.368	Adjusted Chi Square Value (2.99, β)	0.137
95% Gamma Approximate UCL (use when n>=50)	1.212	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.151	SD (KM)	0.264
Variance (KM)	0.0699	SE of Mean (KM)	0.145
k hat (KM)	0.328	k star (KM)	0.265
nu hat (KM)	3.28	nu star (KM)	2.645
theta hat (KM)	0.462	theta star (KM)	0.573
80% gamma percentile (KM)	0.224	90% gamma percentile (KM)	0.453
95% gamma percentile (KM)	0.721	99% gamma percentile (KM)	1.429

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.65, α)	0.276	Adjusted Chi Square Value (2.65, β)	0.105
95% Gamma Approximate KM-UCL (use when n>=50)	1.454	95% Gamma Adjusted KM-UCL (use when n<50)	3.822

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.275	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.15	Mean in Log Scale	-3.421
SD in Original Scale	0.296	SD in Log Scale	1.789
95% t UCL (assumes normality of ROS data)	0.433	95% Percentile Bootstrap UCL	0.413
95% BCA Bootstrap UCL	0.419	95% Bootstrap t UCL	9.704
95% H-UCL (Log ROS)	304.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.369	KM Geo Mean	0.0344
KM SD (logged)	1.573	95% Critical H Value (KM-Log)	7.449
KM Standard Error of Mean (logged)	0.876	95% H-UCL (KM -Log)	41.6
KM SD (logged)	1.573	95% Critical H Value (KM-Log)	7.449
KM Standard Error of Mean (logged)	0.876		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.152	Mean in Log Scale	-3.328
SD in Original Scale	0.296	SD in Log Scale	1.721
95% t UCL (Assumes normality)	0.433	95% H-Stat UCL	170.8

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.46

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'-DDE (so-15)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Number of Detects	1	Number of Non-Detects	2
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

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 4,4'-DDE (so-15) was not processed!

4,4'-DDE (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.064	Minimum Non-Detect	0.042
Maximum Detect	1.3	Maximum Non-Detect	0.045
Variance Detects	0.344	Percent Non-Detects	33.33%
Mean Detects	0.424	SD Detects	0.587
Median Detects	0.165	CV Detects	1.385
Skewness Detects	1.953	Kurtosis Detects	3.848
Mean of Logged Detects	-1.528	SD of Logged Detects	1.279

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.713	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Lilliefors Test Statistic	0.405	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.296	KM Standard Error of Mean	0.213
KM SD	0.452	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.726	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.647	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.936	95% KM Chebyshev UCL	1.225
97.5% KM Chebyshev UCL	1.627	99% KM Chebyshev UCL	2.417

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.491	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.668	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.362	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.404	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)	0.877	k star (bias corrected MLE)	0.386
Theta hat (MLE)	0.483	Theta star (bias corrected MLE)	1.098
nu hat (MLE)	7.013	nu star (bias corrected)	3.086
Mean (detects)	0.424		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.286
Maximum	1.3	Median	0.102
SD	0.502	CV	1.758
k hat (MLE)	0.49	k star (bias corrected MLE)	0.356
Theta hat (MLE)	0.583	Theta star (bias corrected MLE)	0.802
nu hat (MLE)	5.877	nu star (bias corrected)	4.272
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (4.27, α)	0.832	Adjusted Chi Square Value (4.27, β)	0.417
95% Gamma Approximate UCL (use when n>=50)	1.467	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.296	SD (KM)	0.452
Variance (KM)	0.204	SE of Mean (KM)	0.213
k hat (KM)	0.43	k star (KM)	0.326
nu hat (KM)	5.155	nu star (KM)	3.911
theta hat (KM)	0.69	theta star (KM)	0.909

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

80% gamma percentile (KM)	0.463	90% gamma percentile (KM)	0.865
95% gamma percentile (KM)	1.32	99% gamma percentile (KM)	2.49

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.91, α)	0.687	Adjusted Chi Square Value (3.91, β)	0.332
95% Gamma Approximate KM-UCL (use when n>=50)	1.687	95% Gamma Adjusted KM-UCL (use when n<50)	3.493

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.291	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.285	Mean in Log Scale	-2.688
SD in Original Scale	0.503	SD in Log Scale	2.051
95% t UCL (assumes normality of ROS data)	0.698	95% Percentile Bootstrap UCL	0.676
95% BCA Bootstrap UCL	0.728	95% Bootstrap t UCL	2.086
95% H-UCL (Log ROS)	776.7		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.076	KM Geo Mean	0.125
KM SD (logged)	1.19	95% Critical H Value (KM-Log)	4.788
KM Standard Error of Mean (logged)	0.561	95% H-UCL (KM -Log)	3.258
KM SD (logged)	1.19	95% Critical H Value (KM-Log)	4.788
KM Standard Error of Mean (logged)	0.561		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.29	Mean in Log Scale	-2.295
SD in Original Scale	0.5	SD in Log Scale	1.547
95% t UCL (Assumes normality)	0.701	95% H-Stat UCL	21.88

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 Bootstrap t UCL	N/A	ı Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	3.493

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'-DDE (so-17)

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	4
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.038	Minimum Non-Detect	0.0092
Maximum Detect	0.7	Maximum Non-Detect	0.48
Variance Detects	0.103	Percent Non-Detects	50%
Mean Detects	0.219	SD Detects	0.321
Median Detects	0.0695	CV Detects	1.465
Skewness Detects	1.977	Kurtosis Detects	3.92
Mean of Logged Detects	-2.254	SD of Logged Detects	1.309

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.685	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.411	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.122	KM Standard Error of Mean	0.0902
KM SD	0.22	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.293	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.27	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.392	95% KM Chebyshev UCL	0.515
97.5% KM Chebyshev UCL	0.685	99% KM Chebyshev UCL	1.019

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.604	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.669	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.38	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.404	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)	0.805	k star (bias corrected MLE)	0.368
Theta hat (MLE)	0.272	Theta star (bias corrected MLE)	0.596
nu hat (MLE)	6.438	nu star (bias corrected)	2.943
Mean (detects)	0.219		

Gamma ROS Statistics using Imputed Non-Detects

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.115
Maximum	0.7	Median	0.024
SD	0.238	CV	2.077
k hat (MLE)	0.502	k star (bias corrected MLE)	0.397
Theta hat (MLE)	0.228	Theta star (bias corrected MLE)	0.289
nu hat (MLE)	8.036	nu star (bias corrected)	6.356
Adjusted Level of Significance (β)	0.0195		
Approximate Chi Square Value (6.36, α)	1.824	Adjusted Chi Square Value (6.36, β)	1.277
95% Gamma Approximate UCL (use when n>=50)	0.399	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.122	SD (KM)	0.22
Variance (KM)	0.0485	SE of Mean (KM)	0.0902
k hat (KM)	0.305	k star (KM)	0.274
nu hat (KM)	4.885	nu star (KM)	4.386
theta hat (KM)	0.399	theta star (KM)	0.444
80% gamma percentile (KM)	0.182	90% gamma percentile (KM)	0.362
95% gamma percentile (KM)	0.573	99% gamma percentile (KM)	1.126

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.39, α)	0.88	Adjusted Chi Square Value (4.39, β)	0.554
95% Gamma Approximate KM-UCL (use when n>=50)	0.607	95% Gamma Adjusted KM-UCL (use when n<50)	0.963

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.845	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.31	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.117	Mean in Log Scale	-3.344
SD in Original Scale	0.237	SD in Log Scale	1.549
95% t UCL (assumes normality of ROS data)	0.276	95% Percentile Bootstrap UCL	0.278
95% BCA Bootstrap UCL	0.358	95% Bootstrap t UCL	1.39
95% H-UCL (Log ROS)	2.037		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.201	KM Geo Mean	0.0407
KM SD (logged)	1.377	95% Critical H Value (KM-Log)	4.406
KM Standard Error of Mean (logged)	0.605	95% H-UCL (KM -Log)	1.041
KM SD (logged)	1.377	95% Critical H Value (KM-Log)	4.406

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM Standard Error of Mean (logged)	0.605

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.171	Mean in Log Scale	-2.718
SD in Original Scale	0.233	SD in Log Scale	1.666
95% t UCL (Assumes normality)	0.327	95% H-Stat UCL	6.978

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 Bootstrap t UCL N/A ı Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 0.963

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'-DDE (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	4	Number of Non-Detects	3
Number of Distinct Detects	3	Number of Distinct Non-Detects	3
Minimum Detect	0.0074	Minimum Non-Detect	0.0041
Maximum Detect	0.18	Maximum Non-Detect	0.45
Variance Detects	0.00731	Percent Non-Detects	42.86%
Mean Detects	0.109	SD Detects	0.0855
Median Detects	0.125	CV Detects	0.782
Skewness Detects	-0.443	Kurtosis Detects	-3.499
Mean of Logged Detects	-2.749	SD of Logged Detects	1.506

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.857	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0743	KM Standard Error of Mean	0.0369
KM SD	0.0782	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.146	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.135	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.185	95% KM Chebyshev UCL	0.235
97.5% KM Chebyshev UCL	0.304	99% KM Chebyshev UCL	0.441

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.467	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.666	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.309	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.402	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)	1.069	k star (bias corrected MLE)	0.434
Theta hat (MLE)	0.102	Theta star (bias corrected MLE)	0.252
nu hat (MLE)	8.556	nu star (bias corrected)	3.472
Mean (detects)	0.109		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0074	Mean	0.0715
Maximum	0.18	Median	0.0431
SD	0.0775	CV	1.084
k hat (MLE)	0.845	k star (bias corrected MLE)	0.578
Theta hat (MLE)	0.0846	Theta star (bias corrected MLE)	0.124
nu hat (MLE)	11.83	nu star (bias corrected)	8.092
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (8.09, α)	2.788	Adjusted Chi Square Value (8.09, β)	1.939
95% Gamma Approximate UCL (use when n>=50)	0.208	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0743	SD (KM)	0.0782
Variance (KM)	0.00612	SE of Mean (KM)	0.0369
k hat (KM)	0.902	k star (KM)	0.611
nu hat (KM)	12.63	nu star (KM)	8.548
theta hat (KM)	0.0823	theta star (KM)	0.122
80% gamma percentile (KM)	0.122	90% gamma percentile (KM)	0.192
95% gamma percentile (KM)	0.266	99% gamma percentile (KM)	0.442

Gamma Kaplan-Meier (KM) Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Approximate Chi Square Value (8.55, α)	3.056	Adjusted Chi Square Value (8.55, β)	2.155
95% Gamma Approximate KM-UCL (use when n>=50)	0.208	95% Gamma Adjusted KM-UCL (use when n<50)	0.295

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.813	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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	0.0657	Mean in Log Scale	-3.966
SD in Original Scale	0.0816	SD in Log Scale	2.027
95% t UCL (assumes normality of ROS data)	0.126	95% Percentile Bootstrap UCL	0.115
95% BCA Bootstrap UCL	0.123	95% Bootstrap t UCL	0.174
95% H-UCL (Log ROS)	42.12		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.665	KM Geo Mean	0.0256
KM SD (logged)	1.677	95% Critical H Value (KM-Log)	5.731
KM Standard Error of Mean (logged)	0.79	95% H-UCL (KM -Log)	5.281
KM SD (logged)	1.677	95% Critical H Value (KM-Log)	5.731
KM Standard Error of Mean (logged)	0.79		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0953	Mean in Log Scale	-3.536
SD in Original Scale	0.0974	SD in Log Scale	2.119
95% t UCL (Assumes normality)	0.167	95% H-Stat UCL	130.8

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 0.146

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 Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 1:02:23 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 4,4'-DDD (so-01) was not processed!

4,4'-DDD (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Number of Detects	0	Number of Non-Detects	1
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable 4,4'-DDD (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

4,4'-DDD (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	4
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.088	Minimum Non-Detect	0.024
Maximum Detect	0.23	Maximum Non-Detect	0.23
Variance Detects	0.00584	Percent Non-Detects	40%
Mean Detects	0.143	SD Detects	0.0764
Median Detects	0.11	CV Detects	0.536
Skewness Detects	1.572	Kurtosis Detects	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean of Logged Detects	-2.036	SD of Logged Detects	0.503

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.332	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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

KM Mean	0.105	KM Standard Error of Mean	0.0399
KM SD	0.0704	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.19	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.171	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.225	95% KM Chebyshev UCL	0.279
97.5% KM Chebyshev UCL	0.355	99% KM Chebyshev UCL	0.502

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	5.808	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0246	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	34.85	nu star (bias corrected)	N/A
Mean (detects)	0.143		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.102
Maximum	0.23	Median	0.088
SD	0.0808	CV	0.794
k hat (MLE)	1.436	k star (bias corrected MLE)	0.708
Theta hat (MLE)	0.0709	Theta star (bias corrected MLE)	0.144
nu hat (MLE)	14.36	nu star (bias corrected)	7.075

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (7.08, α)	2.212	Adjusted Chi Square Value (7.08, β)	1.216
95% Gamma Approximate UCL (use when n>=50)	0.325	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.105	SD (KM)	0.0704
Variance (KM)	0.00496	SE of Mean (KM)	0.0399
k hat (KM)	2.232	k star (KM)	1.026
nu hat (KM)	22.32	nu star (KM)	10.26
theta hat (KM)	0.0471	theta star (KM)	0.103
80% gamma percentile (KM)	0.169	90% gamma percentile (KM)	0.241
95% gamma percentile (KM)	0.312	99% gamma percentile (KM)	0.478

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.26, α)	4.106	Adjusted Chi Square Value (10.26, β)	2.591
95% Gamma Approximate KM-UCL (use when n>=50)	0.263	95% Gamma Adjusted KM-UCL (use when n<50)	0.417

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.3	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.11	Mean in Log Scale	-2.357
SD in Original Scale	0.0712	SD in Log Scale	0.603
95% t UCL (assumes normality of ROS data)	0.178	95% Percentile Bootstrap UCL	0.162
95% BCA Bootstrap UCL	0.176	95% Bootstrap t UCL	0.252
95% H-UCL (Log ROS)	0.307		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.525	KM Geo Mean	0.08
KM SD (logged)	0.799	95% Critical H Value (KM-Log)	4.06
KM Standard Error of Mean (logged)	0.477	95% H-UCL (KM -Log)	0.558
KM SD (logged)	0.799	95% Critical H Value (KM-Log)	4.06
KM Standard Error of Mean (logged)	0.477		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.111	Mean in Log Scale	-2.539
SD in Original Scale	0.0783	SD in Log Scale	1.113
95% t UCL (Assumes normality)	0.186	95% H-Stat UCL	2.956

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

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Suggested UCL to Use

95% KM (t) UCL 0.19

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'-DDD (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Number of Detects	1	Number of Non-Detects	1
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable 4,4'-DDD (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

4,4'-DDD (so-05)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	2	Number of Non-Detects	9
Number of Distinct Detects	2	Number of Distinct Non-Detects	9
Minimum Detect	0.22	Minimum Non-Detect	0.02
Maximum Detect	0.23	Maximum Non-Detect	0.5
Variance Detects	5.0000E-5	Percent Non-Detects	81.82%
Mean Detects	0.225	SD Detects	0.00707
Median Detects	0.225	CV Detects	0.0314
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-1.492	SD of Logged Detects	0.0314

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

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM Mean	0.0656	KM Standard Error of Mean	0.0402
KM SD	0.0853	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.138	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.132	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.186	95% KM Chebyshev UCL	0.241
97.5% KM Chebyshev UCL	0.317	99% KM Chebyshev UCL	0.465

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2025	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.1113E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8099	nu star (bias corrected)	N/A
Mean (detects)	0.225		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0656	SD (KM)	0.0853
Variance (KM)	0.00727	SE of Mean (KM)	0.0402
k hat (KM)	0.591	k star (KM)	0.491
nu hat (KM)	13.01	nu star (KM)	10.79
theta hat (KM)	0.111	theta star (KM)	0.134
80% gamma percentile (KM)	0.108	90% gamma percentile (KM)	0.178
95% gamma percentile (KM)	0.254	99% gamma percentile (KM)	0.439

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0278
Approximate Chi Square Value (10.79, α)	4.443	Adjusted Chi Square Value (10.79, β)	3.801
95% Gamma Approximate KM-UCL (use when n>=50)	0.159	95% Gamma Adjusted KM-UCL (use when n<50)	0.186

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	0.197	Mean in Log Scale	-1.625
SD in Original Scale	0.014	SD in Log Scale	0.0675
95% t UCL (assumes normality of ROS data)	0.205	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		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.374	KM Geo Mean	0.0342
KM SD (logged)	1.006	95% Critical H Value (KM-Log)	3.01
KM Standard Error of Mean (logged)	0.474	95% H-UCL (KM -Log)	0.148
KM SD (logged)	1.006	95% Critical H Value (KM-Log)	3.01
KM Standard Error of Mean (logged)	0.474		

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.107	Mean in Log Scale	-2.799
SD in Original Scale	0.101	SD in Log Scale	1.203
95% t UCL (Assumes normality)	0.162	95% H-Stat UCL	0.458

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	0.138	KM H-UCL	0.148
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.

4,4'-DDD (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	0.12	Mean	0.997
Maximum	2.5	Median	0.37
SD	1.308	Std. Error of Mean	0.755
Coefficient of Variation	1.312	Skewness	1.661

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	3.202	95% Adjusted-CLT UCL (Chen-1995)	3.013
		95% Modified-t UCL (Johnson-1978)	3.322

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	0.812	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.227	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.872	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.234	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.12	Mean of logged Data	-0.733
Maximum of Logged Data	0.916	SD of logged Data	1.535

Assuming Lognormal Distribution

95% H-UCL	4.461E+9	90% Chebyshev (MVUE) UCL	2.907
95% Chebyshev (MVUE) UCL	3.799	97.5% Chebyshev (MVUE) UCL	5.036
99% Chebyshev (MVUE) UCL	7.467		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	2.239	95% Jackknife UCL	3.202
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	3.262	95% Chebyshev(Mean, Sd) UCL	4.288
97.5% Chebyshev(Mean, Sd) UCL	5.712	99% Chebyshev(Mean, Sd) UCL	8.51

Suggested UCL to Use

95% Student's-t UCL 3.202

Recommended UCL exceeds the maximum observation

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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'-DDD (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 4,4'-DDD (so-07) was not processed!

4,4'-DDD (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 4,4'-DDD (so-08) was not processed!

4,4'-DDD (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 4,4'-DDD (so-09) was not processed!

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

4,4'-DDD (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDD (so-10x) was not processed!

4,4'-DDD (so-11)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	2	Number of Non-Detects	4
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.051	Minimum Non-Detect	0.009
Maximum Detect	0.078	Maximum Non-Detect	0.049
Variance Detects	3.6450E-4	Percent Non-Detects	66.67%
Mean Detects	0.0645	SD Detects	0.0191
Median Detects	0.0645	CV Detects	0.296
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.763	SD of Logged Detects	0.3

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

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

KM Mean	0.0275	KM Standard Error of Mean	0.0158
KM SD	0.0273	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0593	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0534	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0748	95% KM Chebyshev UCL	0.0962

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

97.5% KM Chebyshev UCL	0.126	99% KM Chebyshev UCL	0.184

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	22.49	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00287	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	89.96	nu star (bias corrected)	N/A
Mean (detects)	0.0645		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0275	SD (KM)	0.0273
Variance (KM)	7.4525E-4	SE of Mean (KM)	0.0158
k hat (KM)	1.015	k star (KM)	0.618
nu hat (KM)	12.18	nu star (KM)	7.422
theta hat (KM)	0.0271	theta star (KM)	0.0445
80% gamma percentile (KM)	0.0453	90% gamma percentile (KM)	0.071
95% gamma percentile (KM)	0.0979	99% gamma percentile (KM)	0.163

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0122
Approximate Chi Square Value (7.42, α)	2.405	Adjusted Chi Square Value (7.42, β)	1.505
95% Gamma Approximate KM-UCL (use when n>=50)	0.0849	95% Gamma Adjusted KM-UCL (use when n<50)	0.136

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	0.0327	Mean in Log Scale	-3.648
SD in Original Scale	0.0261	SD in Log Scale	0.698
95% t UCL (assumes normality of ROS data)	0.0541	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.0893		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.062	KM Geo Mean	0.0172
KM SD (logged)	0.926	95% Critical H Value (KM-Log)	3.856
KM Standard Error of Mean (logged)	0.535	95% H-UCL (KM -Log)	0.131
KM SD (logged)	0.926	95% Critical H Value (KM-Log)	3.856
KM Standard Error of Mean (logged)	0.535		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0326	Mean in Log Scale	-3.774
SD in Original Scale	0.0271	SD in Log Scale	1
95% t UCL (Assumes normality)	0.0549	95% H-Stat UCL	0.24

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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	0.0593	KM H-UCL	0.131
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.

4,4'-DDD (so-12)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 4,4'-DDD (so-12) was not processed!

4,4'-DDD (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	0.73	Minimum Non-Detect	0.044
Maximum Detect	0.94	Maximum Non-Detect	0.49
Variance Detects	0.0221	Percent Non-Detects	71.43%
Mean Detects	0.835	SD Detects	0.148
Median Detects	0.835	CV Detects	0.178
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.188	SD of Logged Detects	0.179

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

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

KM Mean	0.27	KM Standard Error of Mean	0.193
KM SD	0.362	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.646	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.588	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.85	95% KM Chebyshev UCL	1.113
97.5% KM Chebyshev UCL	1.477	99% KM Chebyshev UCL	2.194

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	62.91	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0133	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	251.6	nu star (bias corrected)	N/A
Mean (detects)	0.835		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.27	SD (KM)	0.362
Variance (KM)	0.131	SE of Mean (KM)	0.193
k hat (KM)	0.557	k star (KM)	0.414
nu hat (KM)	7.8	nu star (KM)	5.791
theta hat (KM)	0.485	theta star (KM)	0.653
80% gamma percentile (KM)	0.437	90% gamma percentile (KM)	0.758
95% gamma percentile (KM)	1.109	99% gamma percentile (KM)	1.988

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0158
Approximate Chi Square Value (5.79, α)	1.534	Adjusted Chi Square Value (5.79, β)	0.968
95% Gamma Approximate KM-UCL (use when n>=50)	1.019	95% Gamma Adjusted KM-UCL (use when n<50)	1.616

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	0.491	Mean in Log Scale	-0.797
SD in Original Scale	0.243	SD in Log Scale	0.422
95% t UCL (assumes normality of ROS data)	0.669	95% Percentile Bootstrap UCL	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.734		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.285	KM Geo Mean	0.102
KM SD (logged)	1.328	95% Critical H Value (KM-Log)	4.658
KM Standard Error of Mean (logged)	0.71	95% H-UCL (KM -Log)	3.07
KM SD (logged)	1.328	95% Critical H Value (KM-Log)	4.658
KM Standard Error of Mean (logged)	0.71		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.33	Mean in Log Scale	-1.858
SD in Original Scale	0.362	SD in Log Scale	1.507
95% t UCL (Assumes normality)	0.596	95% H-Stat UCL	11.92

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	0.646	KM H-UCL	3.07
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.

4,4'-DDD (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	5
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDD (so-14x) was not processed!

4,4'-DDD (so-15)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Number of Detects	0	Number of Non-Detects	3
Number of Distinct Detects	0	Number of Distinct Non-Detects	3

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 4,4'-DDD (so-15) was not processed!

4,4'-DDD (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
		Number of Missing Observations	2
Number of Detects	1	Number of Non-Detects	5
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 4,4'-DDD (so-16) was not processed!

4,4'-DDD (so-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	6
Number of Detects	1	Number of Non-Detects	7
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

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 4,4'-DDD (so-17) was not processed!

4,4'-DDD (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	6

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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 4,4'-DDD (so-18) was not processed!

UCL Statistics for Data Sets with Non-Detects

n

User Selected Options	
Date/Time of Computation	ProUCL 5.17/10/2018 1:02:05 PM
From File	2018_07_10 PRG-UCL Evaluation Shrew EU_SO ORDERED LOAEL Input DRAFT _a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

beta-BHC (so-01)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.051	Minimum Non-Detect	0.11
Maximum Detect	0.49	Maximum Non-Detect	0.11
Variance Detects	0.0337	Percent Non-Detects	20%
Mean Detects	0.238	SD Detects	0.184
Median Detects	0.205	CV Detects	0.772
Skewness Detects	1.015	Kurtosis Detects	1.969
Mean of Logged Detects	-1.716	SD of Logged Detects	0.937

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.289	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.375	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

KM Mean	0.2	KM Standard Error of Mean	0.0829
KM SD	0.161	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.377	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.337	95% KM Bootstrap t UCL	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

90% KM Chebyshev UCL	0.449	95% KM Chebyshev UCL	0.562
97.5% KM Chebyshev UCL	0.718	99% KM Chebyshev UCL	1.026

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.267	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.661	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.228	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.398	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)	1.939	k star (bias corrected MLE)	0.651
Theta hat (MLE)	0.123	Theta star (bias corrected MLE)	0.365
nu hat (MLE)	15.51	nu star (bias corrected)	5.211
Mean (detects)	0.238		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0242	Mean	0.195
Maximum	0.49	Median	0.19
SD	0.185	CV	0.951
k hat (MLE)	1.175	k star (bias corrected MLE)	0.603
Theta hat (MLE)	0.166	Theta star (bias corrected MLE)	0.323
nu hat (MLE)	11.75	nu star (bias corrected)	6.031
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (6.03, α)	1.656	Adjusted Chi Square Value (6.03, β)	0.846
95% Gamma Approximate UCL (use when n>=50)	0.71	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.2	SD (KM)	0.161
Variance (KM)	0.0258	SE of Mean (KM)	0.0829
k hat (KM)	1.557	k star (KM)	0.756
nu hat (KM)	15.57	nu star (KM)	7.56
theta hat (KM)	0.129	theta star (KM)	0.265
80% gamma percentile (KM)	0.328	90% gamma percentile (KM)	0.494
95% gamma percentile (KM)	0.663	99% gamma percentile (KM)	1.066

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.56, α)	2.483	Adjusted Chi Square Value (7.56, β)	1.403
95% Gamma Approximate KM-UCL (use when n>=50)	0.61	95% Gamma Adjusted KM-UCL (use when n<50)	1.08

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.946	**Shapiro Wilk GOF Test**

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.201	Mean in Log Scale	-1.962
SD in Original Scale	0.179	SD in Log Scale	0.98
95% t UCL (assumes normality of ROS data)	0.372	95% Percentile Bootstrap UCL	0.328
95% BCA Bootstrap UCL	0.342	95% Bootstrap t UCL	0.475
95% H-UCL (Log ROS)	2.416		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.968	KM Geo Mean	0.14
KM SD (logged)	0.884	95% Critical H Value (KM-Log)	4.41
KM Standard Error of Mean (logged)	0.456	95% H-UCL (KM -Log)	1.45
KM SD (logged)	0.884	95% Critical H Value (KM-Log)	4.41
KM Standard Error of Mean (logged)	0.456		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.201	Mean in Log Scale	-1.953
SD in Original Scale	0.179	SD in Log Scale	0.969
95% t UCL (Assumes normality)	0.372	95% H-Stat UCL	2.294

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	0.377

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.

beta-BHC (so-02)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	6
Number of Detects	0	Number of Non-Detects	1
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

The data set for variable beta-BHC (so-02) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

beta-BHC (so-03)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	4	Number of Non-Detects	1
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	0.015	Minimum Non-Detect	0.021
Maximum Detect	1.4	Maximum Non-Detect	0.021
Variance Detects	0.355	Percent Non-Detects	20%
Mean Detects	0.584	SD Detects	0.596
Median Detects	0.46	CV Detects	1.021
Skewness Detects	1.069	Kurtosis Detects	1.147
Mean of Logged Detects	-1.382	SD of Logged Detects	1.977

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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

KM Mean	0.47	KM Standard Error of Mean	0.266
KM SD	0.515	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.037	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.907	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.267	95% KM Chebyshev UCL	1.628
97.5% KM Chebyshev UCL	2.13	99% KM Chebyshev UCL	3.114

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.255	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.672	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.222	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.406	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Gamma Statistics on Detected Data Only

k hat (MLE)	0.714	k star (bias corrected MLE)	0.345
Theta hat (MLE)	0.817	Theta star (bias corrected MLE)	1.691
nu hat (MLE)	5.713	nu star (bias corrected)	2.762
Mean (detects)	0.584		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.469
Maximum	1.4	Median	0.31
SD	0.576	CV	1.229
k hat (MLE)	0.5	k star (bias corrected MLE)	0.333
Theta hat (MLE)	0.938	Theta star (bias corrected MLE)	1.407
nu hat (MLE)	5.003	nu star (bias corrected)	3.334
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (3.33, α)	0.478	Adjusted Chi Square Value (3.33, β)	0.182
95% Gamma Approximate UCL (use when n>=50)	3.272	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.47	SD (KM)	0.515
Variance (KM)	0.265	SE of Mean (KM)	0.266
k hat (KM)	0.834	k star (KM)	0.467
nu hat (KM)	8.341	nu star (KM)	4.67
theta hat (KM)	0.563	theta star (KM)	1.006
80% gamma percentile (KM)	0.769	90% gamma percentile (KM)	1.289
95% gamma percentile (KM)	1.85	99% gamma percentile (KM)	3.237

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.67, α)	1.003	Adjusted Chi Square Value (4.67, β)	0.449
95% Gamma Approximate KM-UCL (use when n>=50)	2.189	95% Gamma Adjusted KM-UCL (use when n<50)	4.892

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.89	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.292	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	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	0.471	Mean in Log Scale	-1.898
SD in Original Scale	0.575	SD in Log Scale	2.065
95% t UCL (assumes normality of ROS data)	1.019	95% Percentile Bootstrap UCL	0.905

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

95% BCA Bootstrap UCL	0.965	95% Bootstrap t UCL	1.675
95% H-UCL (Log ROS)	27695		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.946	KM Geo Mean	0.143
KM SD (logged)	1.901	95% Critical H Value (KM-Log)	8.938
KM Standard Error of Mean (logged)	0.982	95% H-UCL (KM -Log)	4267
KM SD (logged)	1.901	95% Critical H Value (KM-Log)	8.938
KM Standard Error of Mean (logged)	0.982		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.469	Mean in Log Scale	-2.017
SD in Original Scale	0.576	SD in Log Scale	2.224
95% t UCL (Assumes normality)	1.018	95% H-Stat UCL	167824

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	1.037

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.

beta-BHC (so-04)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	6
Number of Detects	1	Number of Non-Detects	1
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable beta-BHC (so-04) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

beta-BHC (so-05)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	11	Number of Distinct Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	8
Minimum Detect	0.041	Minimum Non-Detect	0.01
Maximum Detect	0.12	Maximum Non-Detect	0.25
Variance Detects	0.00185	Percent Non-Detects	72.73%
Mean Detects	0.0903	SD Detects	0.043
Median Detects	0.11	CV Detects	0.476
Skewness Detects	-1.627	Kurtosis Detects	N/A
Mean of Logged Detects	-2.507	SD of Logged Detects	0.596

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	0.843	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.343	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.0394	KM Standard Error of Mean	0.0177
KM SD	0.0422	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0715	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0685	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0925	95% KM Chebyshev UCL	0.117
97.5% KM Chebyshev UCL	0.15	99% KM Chebyshev UCL	0.216

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	5.015	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.018	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	30.09	nu star (bias corrected)	N/A
Mean (detects)	0.0903		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0331
Maximum	0.12	Median	0.01

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

SD	0.0416	CV	1.256
k hat (MLE)	1.073	k star (bias corrected MLE)	0.841
Theta hat (MLE)	0.0308	Theta star (bias corrected MLE)	0.0393
nu hat (MLE)	23.61	nu star (bias corrected)	18.5
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (18.50, α)	9.755	Adjusted Chi Square Value (18.50, β)	8.737
95% Gamma Approximate UCL (use when n>=50)	0.0628	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0394	SD (KM)	0.0422
Variance (KM)	0.00178	SE of Mean (KM)	0.0177
k hat (KM)	0.87	k star (KM)	0.693
nu hat (KM)	19.14	nu star (KM)	15.26
theta hat (KM)	0.0452	theta star (KM)	0.0568
80% gamma percentile (KM)	0.0647	90% gamma percentile (KM)	0.099
95% gamma percentile (KM)	0.134	99% gamma percentile (KM)	0.219

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.26, α)	7.441	Adjusted Chi Square Value (15.26, β)	6.57
95% Gamma Approximate KM-UCL (use when n>=50)	0.0807	95% Gamma Adjusted KM-UCL (use when n<50)	0.0914

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.81	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.359	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.0385	Mean in Log Scale	-3.585
SD in Original Scale	0.0387	SD in Log Scale	0.773
95% t UCL (assumes normality of ROS data)	0.0596	95% Percentile Bootstrap UCL	0.0571
95% BCA Bootstrap UCL	0.0646	95% Bootstrap t UCL	0.124
95% H-UCL (Log ROS)	0.0704		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.788	KM Geo Mean	0.0226
KM SD (logged)	1.022	95% Critical H Value (KM-Log)	3.041
KM Standard Error of Mean (logged)	0.459	95% H-UCL (KM -Log)	0.102
KM SD (logged)	1.022	95% Critical H Value (KM-Log)	3.041
KM Standard Error of Mean (logged)	0.459		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0591	Mean in Log Scale	-3.289
SD in Original Scale	0.0479	SD in Log Scale	1.142
95% t UCL (Assumes normality)	0.0853	95% H-Stat UCL	0.234

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

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 0.0715

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.

beta-BHC (so-06)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Minimum	0.047	Mean	0.916
Maximum	1.7	Median	1
SD	0.83	Std. Error of Mean	0.479
Coefficient of Variation	0.906	Skewness	-0.453

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
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 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.992	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	2.314	95% Adjusted-CLT UCL (Chen-1995)	1.57
		95% Modified-t UCL (Johnson-1978)	2.294

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	0.788	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.161	Theta star (bias corrected MLE)	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

nu hat (MLE)	4.73	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.335	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.058	Mean of logged Data	-0.842
Maximum of Logged Data	0.531	SD of logged Data	1.937

Assuming Lognormal Distribution

95% H-UCL	3.189E+15	90% Chebyshev (MVUE) UCL	3.931
95% Chebyshev (MVUE) UCL	5.185	97.5% Chebyshev (MVUE) UCL	6.925
99% Chebyshev (MVUE) UCL	10.34		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.704	95% Jackknife UCL	2.314
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	2.353	95% Chebyshev(Mean, Sd) UCL	3.004
97.5% Chebyshev(Mean, Sd) UCL	3.907	99% Chebyshev(Mean, Sd) UCL	5.682

Suggested UCL to Use

95% Student's-t UCL 2.314

Recommended UCL exceeds the maximum observation

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.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

beta-BHC (so-07)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	5
		Number of Missing Observations	1
Number of Detects	3	Number of Non-Detects	4
Number of Distinct Detects	3	Number of Distinct Non-Detects	3
Minimum Detect	0.021	Minimum Non-Detect	0.021
Maximum Detect	0.84	Maximum Non-Detect	0.23
Variance Detects	0.198	Percent Non-Detects	57.14%
Mean Detects	0.33	SD Detects	0.445
Median Detects	0.13	CV Detects	1.346
Skewness Detects	1.616	Kurtosis Detects	N/A
Mean of Logged Detects	-2.026	SD of Logged Detects	1.844

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.848	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.34	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.157	KM Standard Error of Mean	0.131
KM SD	0.282	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.411	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.372	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.549	95% KM Chebyshev UCL	0.727
97.5% KM Chebyshev UCL	0.973	99% KM Chebyshev UCL	1.458

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.663	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.498	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.979	nu star (bias corrected)	N/A

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean (detects)	0.33

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.147
Maximum	0.84	Median	0.01
SD	0.309	CV	2.095
k hat (MLE)	0.413	k star (bias corrected MLE)	0.331
Theta hat (MLE)	0.356	Theta star (bias corrected MLE)	0.445
nu hat (MLE)	5.784	nu star (bias corrected)	4.639
Adjusted Level of Significance (β)	0.0158		
Approximate Chi Square Value (4.64, α)	0.989	Adjusted Chi Square Value (4.64, β)	0.577
95% Gamma Approximate UCL (use when n>=50)	0.691	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.157	SD (KM)	0.282
Variance (KM)	0.0794	SE of Mean (KM)	0.131
k hat (KM)	0.309	k star (KM)	0.272
nu hat (KM)	4.326	nu star (KM)	3.805
theta hat (KM)	0.507	theta star (KM)	0.576
80% gamma percentile (KM)	0.234	90% gamma percentile (KM)	0.467
95% gamma percentile (KM)	0.739	99% gamma percentile (KM)	1.456

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.81, α)	0.646	Adjusted Chi Square Value (3.81, β)	0.351
95% Gamma Approximate KM-UCL (use when n>=50)	0.922	95% Gamma Adjusted KM-UCL (use when n<50)	1.696

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	1	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.176	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	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	0.146	Mean in Log Scale	-3.859
SD in Original Scale	0.309	SD in Log Scale	2.156
95% t UCL (assumes normality of ROS data)	0.373	95% Percentile Bootstrap UCL	0.368
95% BCA Bootstrap UCL	0.401	95% Bootstrap t UCL	5.902
95% H-UCL (Log ROS)	126.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.024	KM Geo Mean	0.0486

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

KM SD (logged)	1.345	95% Critical H Value (KM-Log)	4.71
KM Standard Error of Mean (logged)	0.638	95% H-UCL (KM -Log)	1.595
KM SD (logged)	1.345	95% Critical H Value (KM-Log)	4.71
KM Standard Error of Mean (logged)	0.638		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.166	Mean in Log Scale	-2.919
SD in Original Scale	0.301	SD in Log Scale	1.531
95% t UCL (Assumes normality)	0.387	95% H-Stat UCL	4.722

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 0.411

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.

beta-BHC (so-08)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 beta-BHC (so-08) was not processed!

beta-BHC (so-09)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.0037	Minimum Non-Detect	0.0036
Maximum Detect	0.93	Maximum Non-Detect	2.2
Variance Detects	0.281	Percent Non-Detects	40%

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Mean Detects	0.318	SD Detects	0.53
Median Detects	0.021	CV Detects	1.665
Skewness Detects	1.73	Kurtosis Detects	N/A
Mean of Logged Detects	-3.178	SD of Logged Detects	2.826

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use 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 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.764	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.379	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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

KM Mean	0.24	KM Standard Error of Mean	0.244
KM SD	0.399	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.76	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.641	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.972	95% KM Chebyshev UCL	1.304
97.5% KM Chebyshev UCL	1.764	99% KM Chebyshev UCL	2.669

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.333	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.955	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2	nu star (bias corrected)	N/A
Mean (detects)	0.318		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0037	Mean	0.195
Maximum	0.93	Median	0.01
SD	0.411	CV	2.108

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

k hat (MLE)	0.322	k star (bias corrected MLE)	0.262
Theta hat (MLE)	0.605	Theta star (bias corrected MLE)	0.743
nu hat (MLE)	3.224	nu star (bias corrected)	2.623
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (2.62, α)	0.27	Adjusted Chi Square Value (2.62, β)	0.103
95% Gamma Approximate UCL (use when n>=50)	1.893	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.24	SD (KM)	0.399
Variance (KM)	0.159	SE of Mean (KM)	0.244
k hat (KM)	0.361	k star (KM)	0.278
nu hat (KM)	3.611	nu star (KM)	2.778
theta hat (KM)	0.663	theta star (KM)	0.862
80% gamma percentile (KM)	0.36	90% gamma percentile (KM)	0.713
95% gamma percentile (KM)	1.123	99% gamma percentile (KM)	2.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (2.78, α)	0.31	Adjusted Chi Square Value (2.78, β)	0.116
95% Gamma Approximate KM-UCL (use when n>=50)	2.149	95% Gamma Adjusted KM-UCL (use when n<50)	5.724

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.425	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	0.192	Mean in Log Scale	-5.152
SD in Original Scale	0.413	SD in Log Scale	4.001
95% t UCL (assumes normality of ROS data)	0.586	95% Percentile Bootstrap UCL	0.559
95% BCA Bootstrap UCL	0.563	95% Bootstrap t UCL	26.99
95% H-UCL (Log ROS)	2.414E+17		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.791	KM Geo Mean	0.0226
KM SD (logged)	2.262	95% Critical H Value (KM-Log)	10.58
KM Standard Error of Mean (logged)	1.385	95% H-UCL (KM -Log)	46167
KM SD (logged)	2.262	95% Critical H Value (KM-Log)	10.58
KM Standard Error of Mean (logged)	1.385		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.411	Mean in Log Scale	-3.152
SD in Original Scale	0.554	SD in Log Scale	3.023
95% t UCL (Assumes normality)	0.94	95% H-Stat UCL	7.196E+9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.76

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

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.

beta-BHC (so-10x)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	7

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (so-10x) was not processed!

beta-BHC (so-11)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	0	Number of Non-Detects	6
Number of Distinct Detects	0	Number of Distinct Non-Detects	6

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (so-11) was not processed!

beta-BHC (so-12)

General Statistics

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	3
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 beta-BHC (so-12) was not processed!

beta-BHC (so-13)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 beta-BHC (so-13) was not processed!

beta-BHC (so-14x)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

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 beta-BHC (so-14x) was not processed!

beta-BHC (so-15)

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	5
Number of Detects	0	Number of Non-Detects	3
Number of Distinct Detects	0	Number of Distinct Non-Detects	3

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (so-15) was not processed!

beta-BHC (so-16)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	4
		Number of Missing Observations	2
Number of Detects	0	Number of Non-Detects	6
Number of Distinct Detects	0	Number of Distinct Non-Detects	4

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (so-16) was not processed!

beta-BHC (so-17)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	5
Number of Detects	0	Number of Non-Detects	8
Number of Distinct Detects	0	Number of Distinct Non-Detects	5

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable beta-BHC (so-17) was not processed!

beta-BHC (so-18)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	1	Number of Non-Detects	6
Number of Distinct Detects	1	Number of Distinct Non-Detects	5

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 beta-BHC (so-18) was not processed!

Attachment D-1b
Post Corrective Action ProUCL Output for Surficial Soil by Shrew Exposure Unit

ATTACHMENT D-2

Post Corrective Action ProUCL Calculations – Site-wide Surficial Soil

D-2a Post Corrective Action ProUCL Data Set for Site-wide Surficial Soil

D-2b Post Corrective Action ProUCL Output for Site-wide Surficial Soil

Attachment D-2a
Post Corrective Action ProUCL Data Set for Sitewide Surface Soil

SID	LOC_ID	UOM	Lead	D_Lead	Lead_R	D_Lead_R	4,4'-DDT	D_4,4'-DDT	4,4'-DDT_R	D_4,4'-DDT
E27 (0-1) 020618	E27	mg/kg			78400	1			0.25	1
D28 (0-1) 020618	D28	mg/kg			65600	1			0.14	1
C6 (0-1) 021318	C6	mg/kg			45100	1			0.94	1
F8 (0-1) 021318	F8	mg/kg			15100	1			0.41	1
E25 (0-1) 020618	E25	mg/kg			13400	1			1100	1
F3 (0-1) 021318	F3	mg/kg			10100	1			2.6	1
E8 (0-1) 021318	E8	mg/kg			8850	1			12	1
D26 (0-1) 020818	D26	mg/kg			8170	1			0.05	1
D5 (0-1) 021318	D5	mg/kg			7990	1			0.043	0
D4 (0-1) 021418	D4	mg/kg			7080	1			0.038	0
F7 (0-1) 021318	F7	mg/kg			5840	1			5.8	1
F6 (0-1) 021318	F6	mg/kg			5550	1			2.3	1
F9 (0-1) 021318	F9	mg/kg			5550	1			0.83	1
F26 (0-1) 021418	F26	mg/kg			5310	1			0.064	1
E11 (0-1) 020918	E11	mg/kg			4340	1			0.96	1
D27 (0-1) 020618	D27	mg/kg	3740	1			0.059	1		
D18 (0-1) 020818	D18	mg/kg	3600	1			43	0		
E13 (0-1) 020918	E13	mg/kg	2820	1			0.68	1		
D8 (0-1) 021318	D8	mg/kg	2610	1			1.1	1		
F25 (0-1) 021418	F25	mg/kg	2610	1			0.046	0		
D22 (0-1) 020818	D22	mg/kg	2550	1			19	1		
E9 (0-1) 020918	E9	mg/kg	2470	1			0.99	1		
E3 (0-1) 021318	E3	mg/kg	2460	1			2.1	1		
F4 (0-1) 021318	F4	mg/kg	2460	1			280	1		
F5 (0-1) 021318	F5	mg/kg	2330	1			1.9	1		
C27 (0-1) 020618	C27	mg/kg	2130	1			0.38	1		
E5 (0-1) 021318	E5	mg/kg	2100	1			1.5	1		
F28 (0-1) 021418	F28	mg/kg	1890	1			0.045	0		
D9 (0-1) 021318	D9	mg/kg	1820	1			4.4	1		
E28 (0-1) 020618	E28	mg/kg	1780	1			0.14	1		
E7 (0-1) 021318	E7	mg/kg	1730	1			1.3	1		
D12 (0-1) 020918	D12	mg/kg	1720	1			2.7	1		
E21 (0-1) 020918	E21	mg/kg	1540	1			0.68	1		
C26 (0-1) 020818	C26	mg/kg	1530	1			0.043	1		
C8 (0-1) 020918	C8	mg/kg	1510	1			16	1		
F10 (0-1) 021318	F10	mg/kg	1420	1			0.21	0		
E10 (0-1) 020918	E10	mg/kg	1410	1			2.8	1		
E4 (0-1) 021318	E4	mg/kg	1380	1			0.38	1		
D20 (0-1) 020818	D20	mg/kg	1350	1			19	1		
F12 (0-1) 021318	F12	mg/kg	1350	1			7.9	1		
C21 (0-1) 020818	C21	mg/kg	1340	1			0.15	1		
C20 (0-1) 020818	C20	mg/kg			1330	1			1600	1
C22 (0-1) 020818	C22	mg/kg	1320	1			2.6	1		
E6 (0-1) 021318	E6	mg/kg	1230	1			3.4	1		
C23 (0-1) 020818	C23	mg/kg	1210	1			0.046	0		
E2 (0-1) 021318	E2	mg/kg	1190	1			0.055	1		
D13 (0-1) 020918	D13	mg/kg	1110	1			2.6	1		
E14 (0-1) 020918	E14	mg/kg	1060	1			0.14	1		
B27 (0-1) 020818	B27	mg/kg	1030	1			0.042	0		
E23 (0-1) 020818	E23	mg/kg	1020	1			0.51	1		

Attachment D-2a

Post Corrective Action ProUCL Data Set for Sitewide Surface Soil

SID	LOC_ID	UOM	Lead	D_Lead	Lead_R	D_Lead_R	4,4'-DDT	D_4,4'-DDT	4,4'-DDT_R	D_4,4'-DDT
C32 (0-1) 020618	C32	mg/kg		997	1		0.037	1		
D14 (0-1) 020918	D14	mg/kg		990	1		4.6	1		
C5 (0-1) 021318	C5	mg/kg		957	1		5.8	1		
E17 (0-1) 020918	E17	mg/kg		922	1		2.8	1		
E24 (0-1) 020818	E24	mg/kg		911	1		3.1	1		
E22 (0-1) 020918	E22	mg/kg		857	1		11	1		
D16 (0-1) 020818	D16	mg/kg		793	1		1.4	1		
D7 (0-1) 021318	D7	mg/kg		737	1		1.5	1		
E18 (0-1) 020918	E18	mg/kg		718	1		2	1		
D24 (0-1) 020818	D24	mg/kg		708	1		0.012	1		
D17 (0-1) 020918	D17	mg/kg		665	1		130	1		
E15 (0-1) 020918	E15	mg/kg		590	1		0.21	1		
E29 (0-1) 020618	E29	mg/kg		566	1		1.1	1		
D1 (0-1) 021318	D1	mg/kg		551	1		2.4	1		
D21 (0-1) 020818	D21	mg/kg		503	1		9.5	1		
C28 (0-1) 020618	C28	mg/kg		499	1		0.022	0		
E26 (0-1) 020618	E26	mg/kg		495	1		0.62	1		
B22 (0-1) 020818	B22	mg/kg		486	1		0.091	1		
C3 (0-1) 021318	C3	mg/kg		481	1		2.6	1		
A22 (0-1) 020918	A22	mg/kg		412	1		19	1		
A26 (0-1) 020918	A26	mg/kg		407	1		0.19	1		
E32 (0-1) 020618	E32	mg/kg		399	1		0.65	1		
E19 (0-1) 020918	E19	mg/kg		388	1		0.87	1		
D3 (0-1) 021318	D3	mg/kg		361	1		0.35	1		
E30 (0-1) 020618	E30	mg/kg		353	1		0.45	0		
F11 (0-1) 021318	F11	mg/kg		344	1		4.8	1		
F29 (0-1) 021418	F29	mg/kg		344	1		17	1		
D15 (0-1) 020818	D15	mg/kg		328	1		1.1	1		
F27 (0-1) 021418	F27	mg/kg		327	1		0.042	0		
C9 (0-1) 021418	C9	mg/kg		301	1		4.1	1		
B23 (0-1) 020818	B23	mg/kg		300	1		16	1		
D2 (0-1) 021318	D2	mg/kg		299	1		1.5	1		
C31 (0-1) 020618	C31	mg/kg		295	1		0.023	0		
E16 (0-1) 020918	E16	mg/kg		295	1		5.5	1		
B28 (0-1) 020818	B28	mg/kg		273	1		0.029	1		
D30 (0-1) 020618	D30	mg/kg		270	1		0.065	1		
F24 (0-1) 021418	F24	mg/kg		262	1		0.14	1		
B25 (0-1) 020818	B25	mg/kg		257	1		0.38	1		
F31 (0-1) 021418	F31	mg/kg		238	1		82	1		
D32 (0-1) 020618	D32	mg/kg		222	1		0.47	0		
D10 (0-1) 020918	D10	mg/kg		219	1		8.6	1		
C17 (0-1) 020818	C17	mg/kg		217	1		4.9	1		
D33 (0-1) 020618	D33	mg/kg		210	1		8	1		
B12 (0-1) 020918	B12	mg/kg		204	1		0.14	1		
F14 (0-1) 021318	F14	mg/kg		189	1		1.8	1		
F22 (0-1) 021418	F22	mg/kg		189	1		0.63	1		
F23 (0-1) 021418	F23	mg/kg		183	1		0.76	1		
A24 (0-1) 020918	A24	mg/kg		180	1		2.1	1		
D23 (0-1) 020818	D23	mg/kg		180	1		0.046	0		
C7 (0-1) 021318	C7	mg/kg		166	1		0.054	1		

Attachment D-2a
Post Corrective Action ProUCL Data Set for Sitewide Surface Soil

SID	LOC_ID	UOM	Lead	D_Lead	Lead_R	D_Lead_R	4,4'-DDT	D_4,4'-DDT	4,4'-DDT_R	D_4,4'-DDT
F13 (0-1) 021318	F13	mg/kg		161	1		0.97	1		
D31 (0-1) 020618	D31	mg/kg		156	1		0.48	0		
C25 (0-1) 020818	C25	mg/kg		153	1		0.009	0		
F21 (0-1) 021418	F21	mg/kg		146	1		0.087	0		
F32 (0-1) 021418	F32	mg/kg		136	1		6.5	1		
F17 (0-1) 021318	F17	mg/kg		132	1		0.62	1		
D25 (0-1) 020818	D25	mg/kg		131	1		0.044	0		
B24 (0-1) 020818	B24	mg/kg		126	1		1	1		
C14 (0-1) 020918	C14	mg/kg		126	1		0.27	1		
C29 (0-1) 020618	C29	mg/kg		122	1		0.012	1		
E33 (0-1) 020618	E33	mg/kg		120	1		340	1		
D6 (0-1) 021318	D6	mg/kg		107	1		0.84	1		
A25 (0-1) 020918	A25	mg/kg		102	1		0.15	1		
E31 (0-1) 020618	E31	mg/kg		102	1		0.16	1		
F16 (0-1) 021318	F16	mg/kg		99.5	1		2.1	1		
A23 (0-1) 020918	A23	mg/kg		98.5	1		0.12	1		
F15 (0-1) 021318	F15	mg/kg		93.4	1		1.3	1		
B29 (0-1) 020818	B29	mg/kg		92.8	1		0.021	0		
E20 (0-1) 020918	E20	mg/kg		92.7	1		0.22	0		
D34 (0-1) 020618	D34	mg/kg		84.7	1		0.014	1		
E12 (0-1) 020918	E12	mg/kg		84.7	1		6.2	1		
F20 (0-1) 021418	F20	mg/kg		80.2	1		0.055	1		
B26 (0-1) 020818	B26	mg/kg		71.1	1		0.0087	0		
D11 (0-1) 020918	D11	mg/kg		70.3	1		0.78	1		
C10 (0-1) 021418	C10	mg/kg		69.2	1		2.6	1		
E34 (0-1) 021418	E34	mg/kg		67.3	1		0.0042	0		
C13 (0-1) 020918	C13	mg/kg		65.7	1		0.069	1		
D19 (0-1) 020818	D19	mg/kg		59.7	1		14	1		
C4 (0-1) 021318	C4	mg/kg		59.1	1		4.1	1		
C12 (0-1) 020918	C12	mg/kg		57.2	1		0.2	1		
C16 (0-1) 020818	C16	mg/kg		56.4	1		0.18	1		
D29 (0-1) 020618	D29	mg/kg		51.4	1		0.0046	0		
C30 (0-1) 020618	C30	mg/kg		49.7	1		0.0092	0		
F30 (0-1) 021418	F30	mg/kg		46.5	1		0.0046	0		
F18 (0-1) 021418	F18	mg/kg		45.2	1		0.048	0		
B10 (0-1) 020918	B10	mg/kg		38.6	1		1.9	1		
B11 (0-1) 020918	B11	mg/kg		38.1	1		1.1	1		
C11 (0-1) 020918	C11	mg/kg		37.9	1		0.19	1		
F19 (0-1) 021418	F19	mg/kg		37.1	1		0.3	1		
C15 (0-1) 020818	C15	mg/kg		35.4	1		0.3	1		
C19 (0-1) 020818	C19	mg/kg		33.8	1		0.12	1		
E35 (0-1) 021418	E35	mg/kg		33.7	1		0.0041	0		
C24 (0-1) 020818	C24	mg/kg		22.6	1		0.075	1		
C18 (0-1) 020818	C18	mg/kg		14.9	1		0.13	1		

Attachment D-2b
Post Corrective Action ProUCL Output for Sitewide Surface Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.17/25/2018 12:23:25 PM
From File	2018_07_25 LOAEL PRG-UCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead

General Statistics

Total Number of Observations	128	Number of Distinct Observations	118
		Number of Missing Observations	16
Minimum	14.9	Mean	691.1
Maximum	3740	Median	300.5
SD	815.5	Std. Error of Mean	72.08
Coefficient of Variation	1.18	Skewness	1.605

Normal GOF Test

Shapiro Wilk Test Statistic	0.772	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.22	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0787	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	810.6	95% Adjusted-CLT UCL (Chen-1995)	820.6
		95% Modified-t UCL (Johnson-1978)	812.3

Gamma GOF Test

A-D Test Statistic	2.131	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.794	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.104	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.0854	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.777	k star (bias corrected MLE)	0.764
Theta hat (MLE)	889.4	Theta star (bias corrected MLE)	904.5
nu hat (MLE)	198.9	nu star (bias corrected)	195.6
MLE Mean (bias corrected)	691.1	MLE Sd (bias corrected)	790.7
		Approximate Chi Square Value (0.05)	164.3
Adjusted Level of Significance	0.0481	Adjusted Chi Square Value	163.9

Attachment D-2b
Post Corrective Action ProUCL Output for Sitewide Surface Soil

UCL Statistics for Data Sets with Non-Detects

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	823.1	95% Adjusted Gamma UCL (use when n<50)	824.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	5.5395E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0861	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0787	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.701	Mean of logged Data	5.772
Maximum of Logged Data	8.227	SD of logged Data	1.342

Assuming Lognormal Distribution

95% H-UCL	1067	90% Chebyshev (MVUE) UCL	1151
95% Chebyshev (MVUE) UCL	1319	97.5% Chebyshev (MVUE) UCL	1553
99% Chebyshev (MVUE) UCL	2011		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	809.7	95% Jackknife UCL	810.6
95% Standard Bootstrap UCL	809.4	95% Bootstrap-t UCL	824.6
95% Hall's Bootstrap UCL	821.5	95% Percentile Bootstrap UCL	816
95% BCA Bootstrap UCL	811.5		
90% Chebyshev(Mean, Sd) UCL	907.4	95% Chebyshev(Mean, Sd) UCL	1005
97.5% Chebyshev(Mean, Sd) UCL	1141	99% Chebyshev(Mean, Sd) UCL	1408

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 1005

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.

Attachment D-2b
Post Corrective Action ProUCL Output for Sitewide Surface Soil

UCL Statistics for Data Sets with Non-Detects

4,4'-DDT

General Statistics

Total Number of Observations	128	Number of Distinct Observations	93
		Number of Missing Observations	16
Number of Detects	103	Number of Non-Detects	25
Number of Distinct Detects	73	Number of Distinct Non-Detects	21
Minimum Detect	0.012	Minimum Non-Detect	0.0041
Maximum Detect	340	Maximum Non-Detect	43
Variance Detects	2043	Percent Non-Detects	19.53%
Mean Detects	10.86	SD Detects	45.2
Median Detects	1.1	CV Detects	4.163
Skewness Detects	6.186	Kurtosis Detects	39.79
Mean of Logged Detects	0.00171	SD of Logged Detects	2.086

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.255	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.405	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0876	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

KM Mean	8.759	KM Standard Error of Mean	3.604
KM SD	40.57	95% KM (BCA) UCL	14.96
95% KM (t) UCL	14.73	95% KM (Percentile Bootstrap) UCL	15.09
95% KM (z) UCL	14.69	95% KM Bootstrap t UCL	28.11
90% KM Chebyshev UCL	19.57	95% KM Chebyshev UCL	24.47
97.5% KM Chebyshev UCL	31.27	99% KM Chebyshev UCL	44.62

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	7.934	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.872	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.213	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.0964	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)	0.291	k star (bias corrected MLE)	0.289
Theta hat (MLE)	37.33	Theta star (bias corrected MLE)	37.59
nu hat (MLE)	59.91	nu star (bias corrected)	59.5
Mean (detects)	10.86		

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

Attachment D-2b
Post Corrective Action ProUCL Output for Sitewide Surface Soil

UCL Statistics for Data Sets with Non-Detects

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.739
Maximum	340	Median	0.625
SD	40.74	CV	4.662
k hat (MLE)	0.234	k star (bias corrected MLE)	0.234
Theta hat (MLE)	37.32	Theta star (bias corrected MLE)	37.37
nu hat (MLE)	59.94	nu star (bias corrected)	59.87
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (59.87, α)	43.07	Adjusted Chi Square Value (59.87, β)	42.91
95% Gamma Approximate UCL (use when n>=50)	12.15	95% Gamma Adjusted UCL (use when n<50)	12.19

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	8.759	SD (KM)	40.57
Variance (KM)	1646	SE of Mean (KM)	3.604
k hat (KM)	0.0466	k star (KM)	0.0507
nu hat (KM)	11.93	nu star (KM)	12.99
theta hat (KM)	187.9	theta star (KM)	172.7
80% gamma percentile (KM)	1.25	90% gamma percentile (KM)	13.62
95% gamma percentile (KM)	46.83	99% gamma percentile (KM)	189.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.99, α)	5.883	Adjusted Chi Square Value (12.99, β)	5.829
95% Gamma Approximate KM-UCL (use when n>=50)	19.33	95% Gamma Adjusted KM-UCL (use when n<50)	19.52

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.976	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.316	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0546	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0876	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	8.744	Mean in Log Scale	-0.777
SD in Original Scale	40.73	SD in Log Scale	2.493
95% t UCL (assumes normality of ROS data)	14.71	95% Percentile Bootstrap UCL	15.41
95% BCA Bootstrap UCL	17.8	95% Bootstrap t UCL	25.03
95% H-UCL (Log ROS)	24.16		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.898	KM Geo Mean	0.407
KM SD (logged)	2.687	95% Critical H Value (KM-Log)	4.11
KM Standard Error of Mean (logged)	0.243	95% H-UCL (KM -Log)	40.08

Attachment D-2b
Post Corrective Action ProUCL Output for Sitewide Surface Soil

UCL Statistics for Data Sets with Non-Detects

KM SD (logged)	2.687	95% Critical H Value (KM-Log)	4.11
KM Standard Error of Mean (logged)	0.243		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	8.914	Mean in Log Scale	-0.729
SD in Original Scale	40.74	SD in Log Scale	2.55
95% t UCL (Assumes normality)	14.88	95% H-Stat UCL	30.35

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

KM H-UCL 40.08

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.

APPENDIX E

RESPONSE TO EPD JUNE 29, 2018 COMMENTS

RESPONSE TO GEORGIA ENVIRONMENTAL PROTECTION DIVISION JUNE 29, 2018
COMMENTS ON VRP STATUS REPORTS #10, #11, #12
FORMER ESTECH GENERAL CHEMICAL SITE – ATLANTA, GEORGIA

Response to EPD September 22, 2016 Comments on Status Reports# 6 through# 9 in Appendix C of the VRP Status Report# 10

1. Response to Comment # 1:
Note and accepted

Response to Response to Comment # 1:
BFEL has noted this.

2. Response to Comment # 2:
EPD concurs with deferring the installation of vertical delineation well until after groundwater remediation is implemented.

Response to Response to Comment #2:
BFEL has noted this.

3. Response to Comment # 3:
EPD concurs with removing monitoring well MW-105 from point of demonstration (POD) well list and using MW-117 as an alternative. While it is not ideal to have constituents at POD wells exceed concentrations at the point of exposure (POE), based on their hydraulically upgradient position and near surface water level screen intervals, EPD concurs with the use of monitoring wells MW-119 and MW-120 as POD wells. EPD requests that MW-121 continue to be used as a POD well based on its close proximity to the POE and hydraulically upgradient position. Please adjust figures to show the four POD wells in future reports.

Response to Response to Comment # 3:
In Status Report No. 13, Figures 3 through 6 show wells MW-117, MW-119, MW-120, and MW-121 as POD wells for the site. Monitoring well MW-117 is a replacement POD for well MW-105. Status Reports going forward will continue to show these 4 POD wells.

4. Response to Comment #4 and # 5:
Decisions related to area averaging will be made by the newly assigned compliance officer and manager from the VRP unit. The transfer of this site to the VRP unit will be effective July 1, 2018.

Response to Comment #4 and #5:
BFEL acknowledges that the site regulatory unit transfer will have commenced on this date.

Response to EPD Comments on VRP Status Reports# 10, # 11 and # 12:

5. Groundwater Concentrations in the former pond area in the vicinity of monitoring wells OW-1, OW-2 and OW-3 may be indicative of a separate source area not linked to offsite contamination from the adjacent M&J Solvents HSI site. Please continue to monitor the wells in the former pond area and wells hydraulically downgradient of the former pond area for VOCs. Should this be a separate source area, plume monitoring and source area/groundwater remediation will need to be addressed separately from the offsite contamination to the north.

Response to Comment #5:
BFEL will continue to monitor wells in the vicinity of the former pond area and those downgradient of it in an effort to better understand the presence of VOCs in the vicinity of OW-1, OW-2, and OW-3.

6. Monitoring well MW-120 detected cis-1 ,2-dichloroethene and trichloroethene, and MW-121 detected trichloroethene during the most recent November 2017 sampling event. Should VOC concentrations increase in wells MW-120 and MW-121 to levels that exceed Georgia Instream Water Quality Standards (ISWQS), VOCs may need to be added to the surface water sampling analyte list. [Comment 4c] This response is acceptable.

Response to Comment #6:
BFEL will continue to monitor the VOC trends in groundwater from wells MW-120 and MW-121. Sample results for the May 2018 sampling event showed VOC concentrations returning to levels more consistent with recent historical concentrations levels from anomalously high concentrations of trichloroethene (TCE) and cis-1,2-dichloroethene (cis-DCE) during the November 2017 groundwater sampling event as shown in the table below.

	MW-120 5/16/2018	MW-120 11/7/2017	MW-121 5/11/2018	MW-121 11/7/2017
cis-1,2-Dichloroethene	14	16	<5.0	<5.0
Trichloroethene	6.8	9.3	<5.0	5.4

The TCE groundwater concentrations are below the Georgia In-Stream Water Quality Criteria (ISWQC) of 30 µg/L. There is no ISWQC for cis-1,2-dichloroethene.

7. EPD concurs with the proposed future actions presented in VRP Status Reports #10, #11, and #12 and the revised remediation approach presented in Section 3.4 of the VRP Status Report #12.

Response to Comment# 7:
BFEL has noted this.

8. Please be advised that the submittal of the final Compliance Status Report has far exceeded the 5-year time frame of February 8, 2017. Therefore, EPD may issue a VRP Consent Order to establish a compliance schedule for continued participation in the VRP in accordance with the Act. This would be sent to BFEL under separate letter by the VRP unit.

Response to Comment# 8:
BFEL would like to schedule a meeting with EPD to discuss the current site conditions and the path forward for the site.