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erm.com

Lauren Hunt Martin, MS
Illinois Environmental Protection Agency
Bureau of Water
Division of Public Water Supplies
Groundwater Section
1021 N. Grand Avenue
Springfield, IL 62702

DATE
31 January 2024

SUBJECT
2023 Annual Consolidated Report
Grand Tower Energy Center
Closed CCR Residuals Impoundment
1820 Power Plant Rd
Grand Tower, IL 62942

REFERENCE
0599247

Dear Lauren:

Environmental Resources Management (ERM) Inc. is submitting the 2023 Annual Consolidated Report in accordance with 35 Illinois Administrative Code (IAC) §845.550(a)(3) and 35 IAC §845.610(e) for the Grand Tower Energy Center (GTEC) facility located at 1820 Power Plant Rd, Grand Tower, Illinois (the "Site"). Attached to this letter is the 2023 GTEC Annual Groundwater Monitoring Report as well as the 2023 GTEC Annual Inspection Report.

If you have any questions, please feel free to contact Randy Homburg at (314) 447-7237.

Sincerely,

Randy Homburg
Managing Consultant

Alan J. Cork, P.E.
Partner, Engineer

Attachments

cc: John Brodhead – GTEC (jbrodhead@grandtowerec.com)

2023 Grand Tower Energy Center Annual Groundwater Monitoring Report

PREPARED FOR
Rockland Capital, LLC

DATE
31 January 2024

REFERENCE
0599247

SIGNATURE PAGE

2023 Grand Tower Energy Center Annual Groundwater Monitoring Report

31 January 2024

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Randy Homburg
Managing Consultant, Geology

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CONTENTS

EXECUTIVE SUMMARY

In accordance with 35 Illinois Administrative Code (IAC) Section 845.610(e)(4), the following section provides a summary overview of groundwater monitoring activity at the Site during 2023:

- Eight episodes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentrations at the Site utilizing data from background wells APW-1R and APW-09. The final Groundwater Protection Standards (GWPS) are the higher of the values between those provided in 35 IAC Section 845.600(a) and the calculated background concentrations.
- Assessment of corrective measures began on 16 June 2022, with the commencement of the initial post-closure groundwater sampling event. Groundwater monitoring, monitoring well inspection and monitoring well gauging events were conducted during the first, second, third, and fourth quarters of 2023. Figures 3, 4, 5 and 6 provide a visual delineation of monitoring well locations with exceedances of the GWPS in accordance with 35 IAC Section 845.600(a)1 and 35 IAC Section 845.600(a)2 during all four quarters of 2023, respectively.
- During 2023 there were exceedances of the GWPS during one or more quarters. These exceedances are summarized as follows:
  - Sulfate: APW-02
  - Arsenic: APW-02, APW-06D, APW-10S
  - Boron: APW-02, APW-03, APW-05 (Q1), APW-05R (Q2, Q3, and Q4), APW-06D, APW-06S
  - Calcium: APW-02, APW-03, APW-05 (Q1), APW-05R (Q2, Q3, and Q4), APW-06D, APW-06S, APW-07, APW-09[1], APW-10D, APW-10S
  - Cobalt: APW-10D
  - Turbidity: APW-01R, APW-02, APW-03, APW-04, APW-05R (Q2, Q3, and Q4), APW-06D, APW-07, APW-08, APW-09, APW-10D, APW-10S
  - Lithium: APW-02, APW-03, APW-04, APW-05 (Q1), APW-05R (Q2, Q3, and Q4), APW-06S, APW-10S
  - Molybdenum: APW-02, APW-05 (Q1), APW-05R (Q2, Q3, and Q4), APW-06S
- The GTEC coal combustion residuals (CCR) impoundment is currently in Corrective Action Monitoring (CAM). After seven quarterly CAM events have been completed, the groundwater sampling results will be evaluated to determine if statistically significant increases or decreases have occurred after cap and closure occurred in 2020 in accordance with 35 IAC Section 845.640(f). The statistical evaluation of the first seven CAM groundwater sampling events is anticipated to be completed during the first quarter of 2024. In accordance with 35 IAC Section 845.550(a) an Annual Groundwater Monitoring and Corrective Action Report will also be submitted for the preceding calendar year no later than 31 January 2024.
- A potentiometric surface map for all quarters of 2023, as required by 35 IAC Section 845.650(b)(2), are included as Figures 7, 8, 9, and 10.

[1]*During Q4, the duplicate sample collected at APW-09 (DUP-02) exceeded the GWPS for calcium; however, the normal sample at APW-09 was below the GWPS during the fourth quarter 2024 sampling event.*

- The well screen of APW-05 was found to be damaged during 2022, which had allowed the sand pack to enter the monitoring well. An Illinois licensed well driller abandoned and replaced APW-05 during the first quarter of 2023.

1. INTRODUCTION

Environmental Resources Management (ERM) Inc. is submitting the 2023 Annual Groundwater Monitoring Report in accordance with 35 Illinois Administrative Code (IAC) Section 845.550(a)(3) and 35 IAC Section 845.610(e) for the Grand Tower Energy Center (GTEC) facility located at 1820 Power Plant Rd, Grand Tower, Illinois (the "Site"). A site location map is provided as Figure 1. The location of all Site monitoring wells is provided as Figure 2. This report summarizes the results and findings of the GTEC quarterly post-closure groundwater sampling events conducted during 2023.

2. BACKGROUND

GTEC historically operated as a merchant facility, which sold energy into the Midcontinent Independent System Operator (MISO) distribution system and has been idled since late 2020. The immediate project site, south of the idled power generation facility, consists of an approximately 21-acre area consisting of an impoundment and associated drainage basin. The GTEC CCR impoundment was capped and closed in 2020 and is subject to USEPA 40 CFR 257 and IEPA 35 IAC 845, as applicable. Approximately 235,000 cubic yards of CCR materials are present in the closed impoundment. These materials have been excavated, consolidated, and covered by a 40-mil LLDPE liner, cover soil, and geotextile liner which covers a 14-acre footprint within the Site.

The 2023 groundwater sampling activities were performed in accordance with the post-closure groundwater monitoring program presented within the Grand Tower Operating Permit Application submitted to the IEPA on 28 October 2021 and further modified according to the Consolidated IEPA Comments dated 17 March 2022 received via email. The purpose of the sampling was to initiate the five-year period of quarterly groundwater monitoring for the evaluation of the concentration and areal distribution of impacts related to the closed CCR impoundment in Site groundwater.

The parameters detected in the groundwater are associated with the closed CCR impoundment. This report provides a comprehensive overview of field activities, laboratory analysis, and documentation of any other site-related activities as required throughout the 2023 sampling events.

3. KEY ACTIONS COMPLETED DURING 2023

The following Site activities were completed quarterly during 2023 and performed in accordance with the post-closure groundwater monitoring program:

- Abandonment, redrill, and development of APW-05/APW-05R (During Q1).
- Quarterly inspection of the final cover system of the CCR Impoundment.
- Quarterly inspection of the Site groundwater monitoring wells; and
- Quarterly groundwater monitoring.

3.1 MONITORING WELL INSPECTION AND GAUGING

During the first, second, third, and fourth quarters of 2023, monitoring well inspections and gauging events were conducted. The monitoring well inspection forms can be found within Appendix A of this report. The monitoring well protectors and casings were also inspected for damage and/or signs of settling that might impact the integrity of the surface seals. The inspection tasks included gauging total depths as well as static groundwater elevations. Both measurements were referenced from the top of casing (TOC) at each of the Site monitoring wells. Total depth and groundwater level measurements were obtained from the monitoring wells using a water level meter with an accuracy of 0.01 foot. Based upon these measurements, a shallow groundwater contour map for the Site was developed for each quarter of 2023. Figure 2 shows the layout of the site and the monitoring well locations, and Figures 7, 8, 9 and 10 show the quarterly groundwater contours and groundwater flow direction arrows, groundwater elevations at each monitoring well, and the Mississippi River elevation at the time of groundwater level gauging. The groundwater gradient is primarily from east to west towards the Mississippi River except for during times of flooding events that may cause a reverse flow from west to east for a short period of time (Natural Resource Technology, Phase 1 Hydrogeologic Assessment Report, March 2013). During the 2023 quarterly groundwater sampling events, no reverse flow conditions were noted.

During the first quarter of 2023 inspection and sampling event, the well screen of monitoring well APW-05 was still found to be occluded > 40% due to infiltration of filter pack sand into the well casing from a compromised well screen. Between 6 and 7 February, APW-05 was abandoned per Illinois Department of Public Health (IDPH) regulations, and a new well, APW-05R, was drilled by Bulldog Drilling of Dupo, IL, an Illinois licensed well driller. APW-05R was subsequently developed according to USEPA guidelines. Copies of the IDPH abandonment log for APW-05, the well construction log for APW-05R, and the well development log for APW-05R are included as Appendix B.

3.2 GROUNDWATER MONITORING

The Groundwater Protection Standards (GWPS) for the Site are those provided in 35 IAC Section 845.600(a). Assessment of corrective measures began on 16 June 2022 with the commencement of the initial post-closure groundwater sampling event. The groundwater monitoring well network surrounding the closed CCR impoundment includes APW-01R, APW-02, APW-03, APW-04, APW-05R, APW-06D, APW-06S, APW-07, APW-08, APW-09, APW-10D, and APW-10S. APW-01R and APW-09 serve as background wells.

As mentioned in the preceding section, APW-05 was abandoned and replaced by APW-05R during the first quarter. APW-05 was sampled only for the first quarter of 2023. After the replacement of APW-05 with APW-05R, APW-05R was sampled for the second, third and fourth quarters of 2023. The remaining 11 groundwater monitoring wells were sampled during all quarters of sampling in 2023.

Monitoring Event	Sampling Dates	Number of Wells Sampled
First Quarter 2023	1/30/2023 – 2/2/2023	12
Second Quarter 2023	6/26/2023 - 6/27/2023	12
Third Quarter 2023	9/19/2023 - 9/20/2023	12
Fourth Quarter 2023	11/27/2023 - 11/29/2023	12

The monitoring wells were purged prior to sampling using a submersible pump according to USEPA low flow purging and sampling procedures ("Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells" revised September 19, 2017). The pump intake was placed within the screened interval of each monitoring well sampled and stabilization measurements were collected using a calibrated YSI Professional Plus meter for the first, second, and third quarter and a YSI ProDSS meter for the fourth quarter. These meters obtained measurements for the collection of pH, specific conductivity, temperature, dissolved oxygen, and oxidation reduction potential (ORP) readings. Turbidity readings were also collected from each monitoring well using a Hach 2100Q Turbidimeter. Well purging continued until stabilization of each field parameter was achieved according to USEPA guidelines for low-flow sampling. Once the field parameters stabilized, the YSI meter was disconnected, and groundwater samples were collected for analysis using the same dedicated polyethylene tubing that was used to purge the well. Field parameter measurements collected during each sampling event were recorded on field data forms. Copies of the field data forms are included in Appendix C.

The groundwater samples collected were placed in laboratory-provided sample containers for analysis by Teklab, Inc. located in Collinsville, IL which is an IEPA-approved laboratory. Samples were transported under chain-of-custody procedures in laboratory-provided coolers containing ice to the laboratory for analytical testing. The laboratory analytical reporting for all four sampling events conducted in 2023 are included in Appendix D.

The IEPA on 28 October 2021, the IEPA evaluates the efficacy of corrective actions for closed CCR impoundments through the comparison of the groundwater analytical results to the GWPS contained in the 35 IAC Section 845.600. As required by 35 IAC Section 845.600, the following groundwater contaminants of concern (COCs) were monitored during 2023:

- Antimony
- Arsenic
- Barium
- Beryllium
- Boron
- Cadmium
- Chloride
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- pH
- Selenium
- Sulfate
- Thallium
- TDS
- Radium 226/228
- Calcium
- Turbidity

3.2.1 GROUNDWATER ANALYTICAL RESULTS

The analytical results for the four post-closure groundwater sampling events conducted during 2023 are presented within the attached Table 1.

During 2023 there were exceedances of the GWPS during one or more quarters. These exceedances are summarized as follows:

GWPS COC	Exceedance Location			
	Q1 2023	Q2 2023	Q3 2023	Q4 2023
Sulfate	APW-02	APW-02	APW-02	APW-02
Arsenic	APW-02, APW-06D, APW-10S	APW-02, APW-06D, APW-10S	APW-06D, APW-10S	APW-02, APW-06D, APW-10S
Boron	APW-02, APW-03, APW-05, APW-06D, APW-06S	APW-02, APW-03, APW-05R, APW-06D, APW-06S	APW-02, APW-03, APW-05R, APW-06D, APW-06S	APW-02, APW-03, APW-05R, APW-06D, APW-06S
Calcium	APW-02, APW-03, APW-05, APW-06D, APW-07, APW-10D, APW-10S	APW-02, APW-03, APW-05R, APW-06D, APW-06S, APW-07, APW-10D, APW-10S	APW-02, APW-03, APW-05R, APW-6D, APW-06S, APW-07, APW-10D, APW-10S	APW-02, APW-03, APW-05R, APW-07, APW-09[1], APW-10D, APW-10S
Cobalt	-	APW-10D	-	-
Turbidity	APW-01R, APW-02, APW-03, APW-04, APW-06D, APW-07, APW-08, APW-09, APW-10D, APW-10S	APW-01R, APW-02, APW-04, APW-05R, APW-06D, APW-08, APW-09, APW-10D, APW-10S	APW-01R, APW-02, APW-04, APW-05R, APW-06D, APW-07, APW-08, APW-10D, APW-10S	APW-01R, APW-02, APW-04, APW-05R, APW-06D, APW-07, APW-08, APW-10D
Lithium	APW-02, APW-05, APW-06S	APW-02, APW-05R, APW-06S,	APW-02, APW-03, APW-04, APW-05R, APW-06S	APW-02, APW-04, APW-05R, APW-06S, APW-10S
Molybdenum	APW-02, APW-05, APW-06S	APW-02, APW-05R, APW-06S,	APW-02, APW-05R, APW-06S	APW-02, APW-05R, APW-06S

[1]*During Q4, the duplicate sample collected at APW-09 (DUP-02) exceeded the GWPS for calcium; however, the normal sample at APW-09 was below the GWPS during the fourth quarter 2024 sampling event.*

APW-10S, located approximately one-half mile south of the closed CCR impoundment historically has exhibited elevated arsenic concentrations. However, the occurrence of arsenic in this well is not considered to be related to the closed CCR impoundment due to its distance and location hydraulically cross-gradient in relation to the Site. Additionally, the monitoring wells located between the closed CCR impoundment (APW-03, APW-07, APW-08, and APW-09) and APW-10D have not historically exhibited arsenic concentrations above the GWPS.

4. STATISTICAL ANALYSIS

This report documents the calculation of site-specific background concentrations for groundwater at the GTEC property located in Grand Tower, Illinois pursuant to Title 35, Section 845.640(f) of the IAC. Site-specific background concentrations were calculated in accordance with United States Environmental Protection Agency Unified Guidance (USEPA, 2009) and the Interstate Technology & Regulatory Council guidance on Groundwater Statistics for Monitoring and Compliance (ITRC, 2013).

Twenty-five analytes were evaluated in this report: antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chloride, chromium, cobalt, dissolved solids, fluoride, iron, lead, lithium, manganese, mercury, molybdenum, nickel, pH, radium-226/228, selenium, sulfate, thallium, and turbidity. The background dataset contains a total of 48 samples collected from 3 wells (APW-01R, APW-04, and APW-09), which are hydraulically upgradient from the coal combustion waste ash basin. Concentrations from the 9 downgradient wells (APW-02, APW-03, APW-05/05R, APW-06D,

APW-06S, APW-07, APW-08, APW-10D, and APW-10S) were compared against the calculated background concentrations to identify potential exceedances.

4.1 DATA PROCESSING STEPS

Several steps were taken when preparing the dataset to ensure that it was appropriate for statistical analysis. The dataset was first reviewed to identify any potential errors or omissions. No duplicate samples were present in the dataset, so duplicate processing steps were not required for this analysis. Since metals in the earliest background samples were only measured for the "total" fraction, "dissolved" fraction results were excluded from the analysis.

Non-detect (ND) samples were handled in accordance with the "15% and 50% Non-Detect Rule" described in USEPA Unified Guidance (USEPA, 2009, p. 15-24). Simple substitution (i.e., replacing NDs with the reporting limit) was limited to well/constituent groups where ≤ 15% of samples were NDs. In cases where > 15% but < 50% of results were NDs, the Kaplan-Meier censored estimation method was used to calculate adjusted background mean and standard deviation estimates. Non-parametric techniques were used for groups with greater than 50% NDs. Figure E1 shows a summary of analyte detections by location.

Data processing and exploratory data analysis were performed using the R programming language (R Core Team, 2023). Data were transformed into a format that is compatible with ProUCL Version 5.2 (USEPA, 2022) for subsequent analysis. Input and output files from the ProUCL analysis are included in Appendix E3.

4.2 EXPLORATORY DATA ANALYSIS

When calculating background groundwater concentrations, assumptions are made about the underlying dataset. For example, some statistical methods assume that a dataset is normally distributed or that concentrations are stationary with respect to time and space. It is important to verify whether these assumptions are valid by examining the dataset through exploratory data analysis (EDA). The EDA process commonly involves inspecting the dataset in a variety of ways, including the generation of figures and tables to summarize data properties. The following analyses were performed for this evaluation prior to the calculation of background concentrations: generation of summary statistics, outlier identification, goodness-of-fit testing, temporal trend analysis, and spatial variability testing. These EDA steps were performed on both the upgradient/background and downgradient wells.

4.2.1 DESCRIPTIVE STATISTICS

Descriptive statistics provide a high-level overview of the dataset properties. A summary table showing sample counts as well as minimum, maximum, median, mean, and standard deviation values for each well/constituent pair and for the pooled upgradient dataset is presented in Table E1. Kaplan-Meier estimates for the mean and standard deviation are provided for groups with 50-85% detected values.

Three analytes were not detected in any of the upgradient wells: beryllium, cadmium, and mercury. One analyte was not detected in any of the downgradient wells: thallium. Ten analytes

were detected in 100% of upgradient and downgradient samples: barium, boron, calcium, dissolved solids, iron, lithium, manganese, pH, radium-226/228, and turbidity.

4.2.2 OUTLIER EVALUATION

The presence of outliers may lead to biased background concentrations since outliers can influence the mean concentration and/or increase the amount of variance in the background dataset. Three different methods were used to identify potential outliers in the dataset, including visual methods (probability plots [Figure E2] and box plots [Figure E3]) and statistical tests (Tukey's outlier test1[1]). Outlier tests were only run on detected values for well/constituent pairs with at least 4 detected values. Upgradient wells were also combined into a single dataset for each constituent and outlier testing was performed on detected values from the pooled dataset. Table E2 shows samples that were identified as potential statistical outliers by these tests.

USEPA recommends that outliers not be excluded from the dataset unless there is compelling evidence to do so, per the following excerpt from the Unified Guidance (USEPA, 2009, p. 5-5):

> "The Unified Guidance recommends that testing of outliers be performed on background data, but they generally not be removed unless some basis for a likely error or discrepancy can be identified. Such possible errors or discrepancies could include data recording errors, unusual sampling and laboratory procedures or conditions, inconsistent sample turbidity, and values significantly outside the historical ranges of background data."

One sample from well APW-09 collected on February 8th, 2018, was notably different from other samples in the dataset. The laboratory report for this sample indicates that the sample was contaminated during analysis, so this sample was excluded from further statistical evaluations. All other samples flagged by Tukey's outlier test were determined to be indicative of natural variability that is observable in most environmental datasets. Therefore, these samples were included in subsequent analyses.

4.2.3 GOODNESS-OF-FIT DISTRIBUTION TESTING

Goodness-of-fit testing was performed on detected values using ProUCL V5.2 for all groups with at least three detections (see Appendix E3). Four different goodness-of-fit tests were employed when identifying data distributions: Shapiro-Wilk and Lilliefors (performed with $\alpha = 0.01$ for normal or $\alpha = 0.10$ for lognormal distributions), or Anderson-Darling and Kolmogorov-Smirnov (performed with $\alpha = 0.05$ for gamma distributions). Results from goodness-of-fit distribution testing are shown in Tables E3 and E4.

4.2.4 TREND ANALYSIS

Mann-Kendall trend tests were performed for each well/constituent pair with at least 5 detected values and 50% detections to check for temporal stability in the dataset. Trend tests were performed with a 95% confidence level. Non-detect values were replaced with half of the minimum reporting limit for each group for trend analyses. Time series figures are presented in Figure E4. Trend analysis results are summarized in Figure E5. Background concentrations were

[1] Tukey's outlier test was performed using a fence value of >3x the interquartile range (IQR).

calculated with de-trended data for groups with statistically significant trends to address any potential influence from temporal trends (Appendix E3[2]).

4.2.5 EVALUATION OF SPATIAL VARIABILITY

Upgradient datasets were evaluated to determine whether significant spatial variability was present in background locations. Only upgradient wells were included in the spatial variability analysis. Analysis of Variance (ANOVA) is a common method for assessing differences between groups (e.g., concentrations for a specific constituent at different wells). Two key assumptions of ANOVA are that data are normally distributed and variance among the groups is approximately equal. In cases where these assumptions are not valid, the non-parametric Kruskal-Wallis test can be used instead of ANOVA.

Based on ANOVA or Kruskal-Wallis testing, fourteen of the twenty-five analytes in the background dataset had statistically significant different concentrations amongst the three upgradient wells: arsenic, barium, boron, calcium, chloride, dissolved solids, fluoride, lithium, molybdenum, nickel, pH, selenium, sulfate, and turbidity. However, concentrations for these analytes fell within the same range for each of the upgradient wells. Therefore, data from the three upgradient wells were pooled into a single background dataset when calculating interwell background statistics (Section 4.3).

4.3 ESTABLISHING BACKGROUND CONCENTRATIONS

Upper tolerance limits (UTLs) were calculated for each analyte to define the background concentrations. A confidence level of 95% and coverage of 95% was used for all parametric calculations. The maximum reporting limit was set as the background concentration for analytes with 100% NDs. Final background concentrations are summarized in Table E3.

4.4 DOWNGRADIENT WELL SCREENING

Downgradient wells were compared against background concentrations to identify potential exceedances. For this comparison, a 95% confidence interval around the mean was calculated for each analyte at each downgradient well (Table E4). The resulting lower confidence limit was then compared to the background concentrations (Table E3) and the Groundwater Protection Standards (GWPS) established in 35 IAC Section 845.600 of the Illinois Administrative Code. An exceedance was noted for groups where the LCL exceeded background concentrations and/or GWPS. This approach is consistent with USEPA Unified Guidance (USEPA, 2009, p. 7-25). Results from this comparison are shown in Figure E6, and are summarized below:

[2] De-trending was performed by calculating an ordinary least squares regression model on the time series data for each well where significant trends were observed, predicting the modeled value at the latest time point, then adding the regression residuals to the latest predicted point.

COCs that Exceed Background, No IEPA GWPS	
COCs	**Monitoring Well(s)**
Calcium	APW-02, APW-07, APW-10S
Nickel	APW-02
COCs that Exceed Background and IEPA GWPS	
COCs	**Monitoring Well(s)**
Arsenic	APW-02, APW-10S
Boron	APW-02, APW-03, APW-05/05R, APW-06D, APW-06S
Lithium	APW-02
Molybdenum	APW-02, APW-05/05R, APW-06S
Sulfate	APW-02

5. CONCLUSION

Based upon the results of 2023 groundwater sampling events and monitoring well inspections, the following observations and conclusions have been made:

- Similar to the groundwater sampling results obtained during the eight pre-closure sampling events in 2017 to 2018, arsenic and sulfate continue to be detected at well locations downgradient of the closed CCR impoundment.
- Boron has historically been the key indicator for corrective action and continued monitoring of groundwater at the Site. Incorporating data from the eight rounds of pre-closure groundwater sampling conducted during 2017 and 2018, as well as the seven post groundwater monitoring events, boron continues to demonstrate a decreasing trend at APW-05R and has been below the GWPS of 2 mg/L at APW-04 since post-closure groundwater monitoring began in second quarter 2022.
- APW-05, found to be damaged during 2022, was abandoned, re-drilled, and replaced by an Illinois licensed well driller during the first quarter of 2023 due to a rupture in the well screen which had allowed the sand pack to enter the monitoring well.
- Woody vegetation (up to 1” diameter) has been noted on the impoundment cap and treated with herbicide. Live woody vegetation growth is limited in the impoundment riprap. During Q4, erosion noted above the riprap has increased from 9” to 10” in the deepest locations as compared to prior inspections dating back to the past quarters and 2022. ERM will continue to monitor and address woody vegetation and erosion on the impoundment cap and notify facility personnel so they can manage these issues appropriately. No significant degradation or issues were noted associated with the overall CCR impoundment cover system.
- Statistical analysis indicates that arsenic, boron, lithium, molybdenum, and sulfate exceed the calculated background concentrations and the IEPA GWPS established in 35 IAC Section 845.600 in monitoring wells on the site.
- Groundwater monitoring wells will be sampled on a quarterly basis during the 2024 calendar year.
- At the end of the current five-year monitoring and reporting post-closure time frame, a groundwater performance monitoring report will be submitted to IEPA to either demonstrate restoration of groundwater quality to Class I standards or present a continued groundwater monitoring plan for an additional five years. In addition, the results will be compared to the modelled concentrations to evaluate if a decreasing trend, as defined through modelling, is

occurring at the predicted rate. Significant changes from the model results will lead to additional calibration and assessment of future expected rates of decrease for the COCs.

6. REFERENCES

Interstate Technology & Regulatory Council (ITRC). 2013. Groundwater Statistics and Monitoring Compliance, Statistical Tools for the Project Life Cycle. GSMC-1. Washington, D.C.: Interstate Technology & Regulatory Council, Groundwater Statistics and Monitoring Compliance Team. https://projects.itrcweb.org/gsmc-1/.

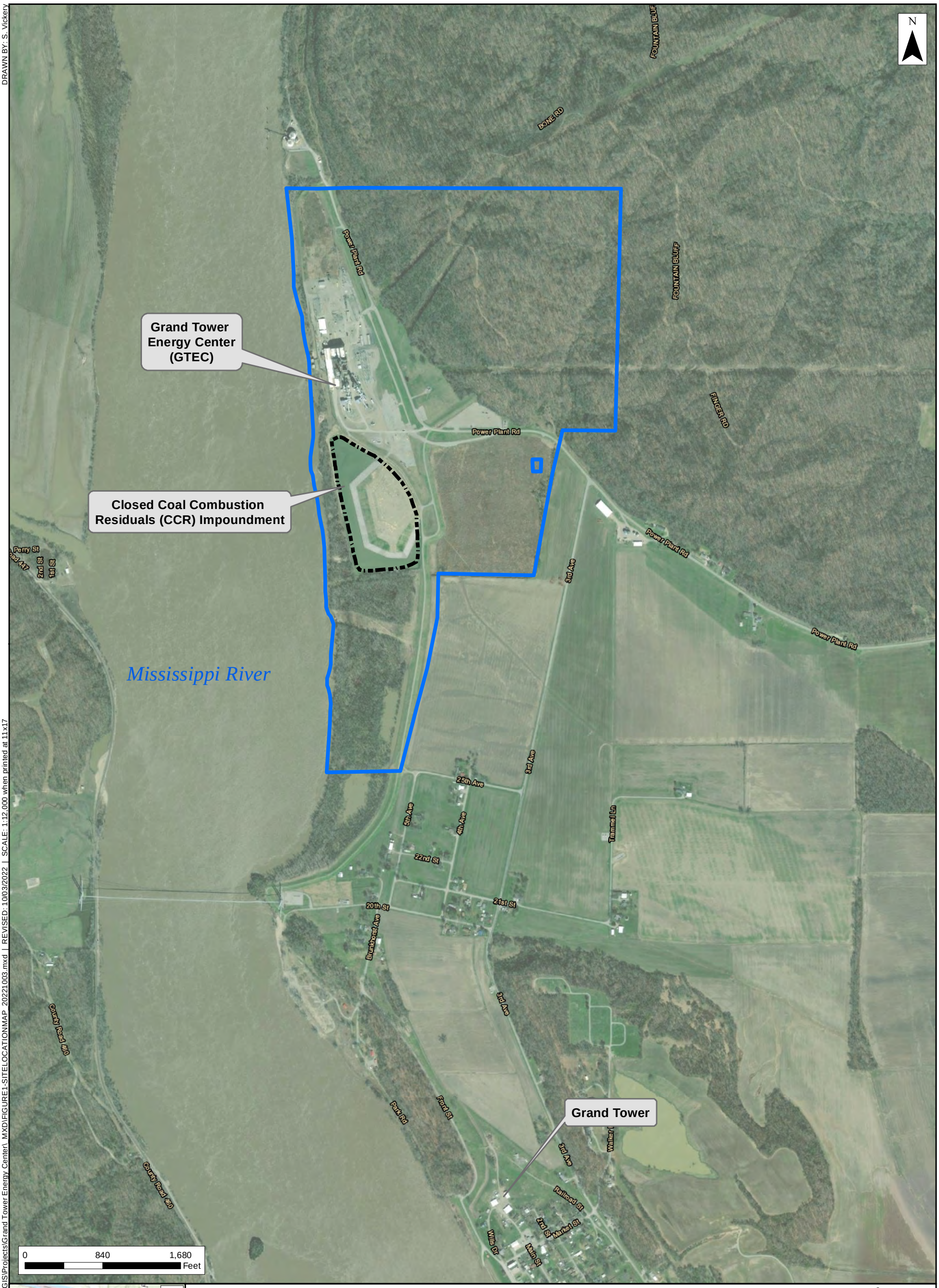
R Core Team. 2023. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org.

United States Environmental Protection Agency (USEPA). 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. Office of Resource Conservation and Recovery Program Implementation and Information Division. https://archive.epa.gov/epawaste/hazard/web/pdf/unified-guid.pdf

FIGURES

DRAWN BY: S. Vickery

FILE: \\usbdcfs02\data\Philadelphia\Team\DMM\GIS\Projects\Grand Tower Energy Center_MXD\FIGURE1-SITELOCATIONMAP_20221003.mxd | REVISED: 10/03/2022 | SCALE: 1:12,000 when printed at 11x17



Legend

- Closed Coal Combustion Residuals (CCR) Impoundment
- Approximate Parcel Boundary

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. World Imagery (3/24/2021)

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

Figure 1
Site Location Map
Grand Tower Energy Center, LLC
Grand Tower, Ilinois
Jackson County

Environmental Resources Management
www.erm.com
ERM


Power Plant Rd
N
APW-1R
APW-05
APW-02
APW-04
APW-06S
APW-06D
APW-03
APW-09
APW-07
APW-08
Mississippi River
APW-10D
APW-10S
25th Ave
0 230 460
Feet
N
0 0.45 0.9
Miles
Legend
Monitoring Well Location
Closed Coal Combustion Residuals (CCR) Impoundment
Approximate Parcel Boundary
Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
Figure 2
Monitoring Well Network
Grand Tower Energy Center, LLC
Grand Tower, Ilinois
Jackson County
Environmental Resources Management
www.erm.com
ERM
Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet
DRAWN BY: S. Vickery
FILE: E:\DMMVGIS\Projects\Grand Tower Energy Center\ MXD\FIGUREX-MONITORINGWELLNETWORK_20230329.mxd | REVISED: 03/29/2023 | SCALE: 1:3,400 when printed at 11x17

DRAWN BY: E.WORKMAN

Power Plant Rd

N

APW-01R	
Turbidity, Field	89.5 NTU

APW-02	
Sulfate	459 mg/L
Turbidity, Field	93.6 NTU
Arsenic, Total	0.0185 mg/L
Arsenic, Dissolved	0.016 mg/L
Boron, Total	8.32 S mg/L
Boron, Dissolved	8.21 mg/L
Calcium, Total	149 S mg/L
Calcium, Dissolved	144 mg/L
Lithium, Total	0.044 mg/L
Lithium, Dissolved	0.0425 mg/L
Molybdenum, Total	0.165 mg/L
Molybdenum, Dissolved	0.155 mg/L

APW-05R	
Boron, Total	7.59 mg/L
Boron, Dissolved	8.68 S mg/L
Calcium, Total	114 mg/L
Calcium, Dissolved	111 mg/L
Lithium, Total	0.0402 mg/L
Lithium, Dissolved	0.045 mg/L
Molybdenum, Total	0.217 mg/L
Molybdenum, Dissolved	0.199 mg/L

APW-04	
Turbidity, Field	37.3 NTU

APW-06S	
Boron, Total	6.84 S mg/L
Boron, Dissolved	7.12 mg/L
Lithium, Total	0.0406 mg/L
Lithium, Dissolved	0.0406 mg/L
Molybdenum, Total	0.265 mg/L
Molybdenum, Dissolved	0.244 mg/L

APW-03	
Turbidity, Field	50.7 NTU
Boron, Total	4.94 mg/L
Boron, Dissolved	4.98 mg/L
Calcium, Total	111 mg/L
Calcium, Dissolved	121 mg/L

APW-09	
Turbidity, Field	23.6 NTU

APW-06D	
Turbidity, Field	26.9 NTU
Arsenic, Total	0.0107 mg/L
Arsenic, Dissolved	0.012 mg/L
Boron, Total	3.95 mg/L
Boron, Dissolved	4.39 mg/L
Calcium, Total	116 mg/L
Calcium, Dissolved	109 mg/L

APW-07	
Turbidity, Field	79.2 NTU
Calcium, Total	200 mg/L
Calcium, Dissolved	199 mg/L

APW-08	
Turbidity, Field	26.9 NTU

Mississippi River

APW-10D	
Turbidity, Field	45.3 NTU
Calcium, Total	122 mg/L
Calcium, Dissolved	114 mg/L

APW-10S	
Turbidity, Field	37.3 NTU
Arsenic, Total	0.191 mg/L
Arsenic, Dissolved	0.171 mg/L
Calcium, Total	145 mg/L
Calcium, Dissolved	145 mg/L

0 200 400 Feet

25th Ave

0 0.45 0.9 Miles

Legend

- Monitoring Well Location
- Closed Coal Combustion Residuals (CCR) Impoundment
- Approximate Parcel Boundary

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. S = Spike Recovery outside recovery limits
3. APW-06D was not sampled during 2nd Quarter 2022 due to a damaged casing.
4. Eight episodes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentrations for the Site utilizing data from background wells APW-1R and APW-09. The final Groundwater Protection Standards (GWPS) are the higher of the values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 07/25/2019 GMZ Application with the exception of turbidity and pH.

Figure 3: First Quarter 2023 Groundwater Exceedances

Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

FILE: M:\US\Projects\G-L\Grand Tower Energy Center\GrandTower_ILL_MXD\Analytical Exceedances\FIGUREX_Q1_ANALYTICAL_EXCEEDANCES_20240119.mxd | REVISED: 01/25/2024 | SCALE: 1:3,400 when printed at 11x17

DRAWN BY: E.WORKMAN

Power Plant Rd

N

APW-1R

APW-01R	
Turbidity, Field	83.2 NTU

APW-02	
Sulfate	500 mg/L
Turbidity, Field	104.3 NTU
Arsenic, Total	0.0148 mg/L
Arsenic, Dissolved	0.011 mg/L
Boron, Total	9.51 S mg/L
Boron, Dissolved	9.24 mg/L
Calcium, Total	167 S mg/L
Calcium, Dissolved	148 mg/L
Lithium, Total	0.048 mg/L
Lithium, Dissolved	0.0455 mg/L
Molybdenum, Total	0.252 mg/L
Molybdenum, Dissolved	0.227 mg/L

APW-05R	
Turbidity, Field	42.6 NTU
Boron, Total	8.76 mg/L
Boron, Dissolved	8.64 mg/L
Calcium, Total	136 B mg/L
Calcium, Dissolved	120 mg/L
Lithium, Total	0.0423 mg/ L
Molybdenum, Total	0.212 mg/L
Molybdenum, Dissolved	0.213 mg/L

APW-05

APW-02

APW-04

APW-04	
Turbidity, Field	38.7 NTU

APW-06S	
Boron, Total	5.84 mg/L
Boron, Dissolved	5.83 mg/L
Calcium, Total	109 B mg/L
Lithium, Total	0.0412 mg/L
Lithium, Dissolved	0.0411 mg/L
Molybdenum, Total	0.235 mg/L
Molybdenum, Dissolved	0.232 mg/L

APW-06S

APW-06D

APW-03

APW-09

APW-03	
Boron, Total	4.67 mg/L
Boron, Dissolved	4.64 mg/L
Calcium, Total	139 B mg/L
Calcium, Dissolved	125 mg/L

APW-09	
Turbidity, Field	24.7 NTU

APW-06D	
Turbidity, Field	181 NTU
Arsenic, Total	0.0115 mg/L
Arsenic, Dissolved	0.0102 mg/L
Boron, Total	4.99 mg/L
Boron, Dissolved	5.01 mg/L
Calcium, Total	128 B mg/L
Calcium, Dissolved	118 mg/L

APW-07

APW-08

APW-07	
Calcium, Total	183 BS mg/L
Calcium, Dissolved	180 B mg/L

APW-08	
Turbidity, Field	152 NTU

Mississippi River

APW-10D	
Turbidity, Field	176 NTU
Calcium, Total	611 B mg/L
Calcium, Dissolved	114 mg/L
Cobalt, Total	0.007 mg/L

APW-10S	
Turbidity, Field	57.2 NTU
Arsenic, Total	0.194 mg/L
Arsenic, Dissolved	0.166 mg/L
Calcium, Total	153 B mg/L
Calcium, Dissolved	142 mg/L

APW-10D

APW-10S

0 200 400 Feet

25th Ave

N

0 0.45 0.9 Miles

Legend

- Monitoring Well Location
- Closed Coal Combustion Residuals (CCR) Impoundment
- Approximate Parcel Boundary

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. S = Spike Recovery outside recovery limits
3. B = Analyte detected in associated Method Blank
4. APW-06D was not sampled during 2nd Quarter 2022 due to a damaged casing.
5. Eight episodes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentrations for the Site utilizing data from background wells APW-1R and APW-09. The final Groundwater Protection Standards (GWPS) are the higher of the values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 07/25/2019 GMZ Application with the exception of turbidity and pH.

Figure 4: Second Quarter 2023 Groundwater Exceedances

Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

FILE: M:\US\Projects\G-L\Grand Tower Energy Center\GrandTower_ILL_MXD\Analytical Exceedances\FIGUREX_Q2_ANALYTICAL_EXCEEDANCES_20240119.mxd | REVISED: 01/25/2024 | SCALE: 1:3,400 when printed at 11x17

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

DRAWN BY: E.WORKMAN

Power Plant Rd

N

APW-1R

APW-01R	
Turbidity, Field	133 NTU

APW-05R	
Turbidity, Field	33.7 NTU
Boron, Total	8.33 S mg/L
Boron, Dissolved	8.05 mg/L
Calcium, Total	126 S mg/L
Calcium, Dissolved	119 mg/L
Lithium, Total	0.0425 mg/L
Lithium, Dissolved	0.0624 mg/L
Molybdenum, Total	0.235 mg/L
Molybdenum, Dissolved	0.235 mg/L

APW-02	
Sulfate	460 mg/L
Turbidity, Field	97 NTU
Boron, Total	8.24 mg/L
Boron, Dissolved	8.91 mg/L
Calcium, Total	151 mg/L
Calcium, Dissolved	132 mg/L
Lithium, Total	0.0422 mg/L
Lithium, Dissolved	0.0583 mg/L
Molybdenum, Total	0.198 mg/L
Molybdenum, Dissolved	0.214 mg/L

APW-05

APW-02

APW-04

APW-04	
Turbidity, Field	21.6 NTU
Lithium, Dissolved	0.0411 mg/L

APW-06S

APW-06D

APW-06S	
Boron, Total	5.79 mg/L
Boron, Dissolved	6.65 mg/L
Calcium, Dissolved	107 mg/L
Lithium, Dissolved	0.0487 mg/L
Molybdenum, Total	0.225 mg/L
Molybdenum, Dissolved	0.234 mg/L

APW-03

APW-09

APW-03	
Boron, Total	4.19 S mg/L
Boron, Dissolved	4.11 mg/L
Calcium, Total	124 S mg/L
Calcium, Dissolved	137 mg/L
Lithium, Dissolved	0.0406 mg/L

APW-09
No Exceedances

APW-06D	
Turbidity, Field	65.5 NTU
Arsenic, Total	0.0109 mg/L
Boron, Total	3.81 mg/L
Boron, Dissolved	3.77 mg/L
Calcium, Total	106 mg/L
Calcium, Dissolved	114 mg/L

APW-07

APW-08

APW-07	
Turbidity, Field	42.9 NTU
Calcium, Total	161 mg/L
Calcium, Dissolved	196 mg/L

APW-08	
Turbidity, Field	141 NTU

Mississippi River

APW-10D	
Turbidity, Field	169 NTU
Calcium, Total	118 mg/L
Calcium, Dissolved	116 mg/L

APW-10S	
Turbidity, Field	63.6 NTU
Arsenic, Total	0.174 mg/L
Arsenic, Dissolved	0.176 mg/L
Calcium, Total	134 mg/L
Calcium, Dissolved	151 mg/L

APW-10D

APW-10S

0 200 400 Feet

25th Ave

N

0 0.45 0.9 Miles

Legend

- Monitoring Well Location
- Closed Coal Combustion Residuals (CCR) Impoundment
- Approximate Parcel Boundary

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. S = Spike Recovery outside recovery limits
3. APW-06D was not sampled during 2nd Quarter 2022 due to a damaged casing.
4. Eight episodes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentrations for the Site utilizing data from background wells APW-1R and APW-09. The final Groundwater Protection Standards (GWPS) are the higher of the values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 07/25/2019 GMZ Application with the exception of turbidity and pH.

Figure 5: Third Quarter 2023 Groundwater Exceedances

Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

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Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

DRAWN BY: E.WORKMAN

Power Plant Rd

N

APW-1R

APW-01R	
Turbidity, Field	95.6 NTU

APW-02	
Sulfate	440 mg/L
Turbidity, Field	169 NTU
Arsenic, Total	0.0237 mg/L
Arsenic, Dissolved	0.0168 mg/L
Boron, Total	9.62 mg/L
Boron, Dissolved	9.57 S mg/L
Calcium, Total	132 mg/L
Calcium, Dissolved	121 S mg/L
Lithium, Total	0.056 mg/L
Lithium, Dissolved	0.0506 mg/L
Molybdenum, Total	0.147 mg/L
Molybdenum, Dissolved	0.205 mg/L

APW-05R	
Turbidity, Field	76.1 NTU
Boron, Total	9.62 mg/L
Boron, Dissolved	8.71 mg/L
Calcium, Total	134 mg/L
Lithium, Total	0.0523 mg/L
Lithium, Dissolved	0.0455 mg/L
Molybdenum, Total	0.215 mg/L
Molybdenum, Dissolved	0.282 mg/L

APW-05

APW-02

APW-04

APW-04	
Turbidity, Field	22.8 NTU
Calcium, Total	124 mg/L

APW-06S

APW-06S	
Boron, Total	9.19 mg/L
Boron, Dissolved	8.41 mg/L
Lithium, Total	0.0564 mg/L
Lithium, Dissolved	0.0498 mg/L
Molybdenum, Total	0.207 mg/L
Molybdenum, Dissolved	0.309 mg/L

APW-06D

APW-06D	
Arsenic, Total	0.0135 mg/L
Arsenic, Dissolved	0.0161 mg/L
Boron, Total	3.8 mg/L
Boron, Dissolved	4.67 mg/L

APW-03

APW-03	
Boron, Total	2.22 mg/L
Calcium, Total	115 mg/L
Calcium, Dissolved	111 mg/L

APW-09

APW-09	
Calcium, Total	111 mg/L

APW-07

APW-07	
Turbidity, Field	21 NTU
Calcium, Total	177 mg/L
Calcium, Dissolved	162 mg/L

APW-08

APW-08	
Turbidity, Field	169 NTU

Mississippi River

APW-10D	
Turbidity, Field	196 NTU
Calcium, Total	120 mg/L

APW-10S	
Arsenic, Total	0.276 mg/L
Arsenic, Dissolved	0.251 mg/L
Calcium, Total	129 S mg/L
Calcium, Dissolved	137 mg/L
Lithium, Total	0.0401 mg/L

APW-10D

APW-10S

0 200 400 Feet

25th Ave

N

0 0.45 0.9 Miles

Legend

- Monitoring Well Location
- Closed Coal Combustion Residuals (CCR) Impoundment
- Approximate Parcel Boundary

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. S = Spike Recovery outside recovery limits
3. APW-06D was not sampled during 2nd Quarter 2022 due to a damaged casing.
4. Eight episodes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentrations for the Site utilizing data from background wells APW-1R and APW-09. The final Groundwater Protection Standards (GWPS) are the higher of the values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 07/25/2019 GMZ Application with the exception of turbidity and pH.

Figure 6: Fourth Quarter 2023 Groundwater Exceedances

Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

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DRAWN BY: S. Vickery

Power Plant Rd

N

APW-1R
333.02

333

APW-05
332.47

APW-02
331.42

331.6

331.8

332

332.2

332.4

APW-04
332.69

332.8

APW-06S
332.73

APW-06D
332.7

APW-03
332.84

332.6

332.8

APW-09
332.75

APW-07
332.59

APW-08
332.76

Mississippi River

332.4

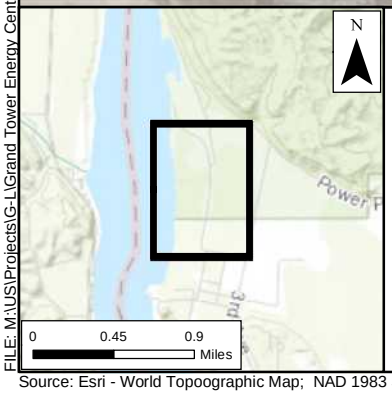
APW-10D
332.69

APW-10S
332.39

***Mississippi River Elevation = 332.97**

0 230 460 Feet

25th Ave



Legend

- Monitoring Well Location
- Groundwater Contour (0.2 Ft. Interval)
- Inferred Groundwater Contour (0.2 Ft. Interval)
- Groundwater Flow Direction
- 348.37 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging January 30, 2023
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Desiginated Wells not used in contoruing
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. Contours are dashed where inferred
7. World Imagery (3/24/2021)

Figure 7: First Quarter 2023 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Ilinois
Jackson County

ERM

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

FILE: M:\US\Projects\G-L\Grand Tower Energy Center\GrandTower_ILL_MXD\Groundwater\FIGUREX-GWC_JANUARY2023_20230316.mxd | REVISED: 01/31/2024 | SCALE: 1:3,400 when printed at 11x17

DRAWN BY: S. Vickery

Power Plant Rd

N

APW-1R
333.90

APW-02
332.37

APW-05R
331.17

APW-04
333.89

APW-06S
332.42

APW-06D
332.79

APW-03
333.78

APW-09
334.40

APW-07
332.92

APW-08
334.19

Mississippi River

APW-10D
334.77

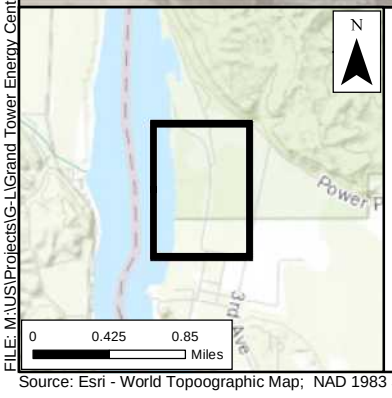
APW-10S
332.72

333.75
331.5
334.25
334
331.75
333
332.25
332
333.5
333.25
332.33
332.75

0 230 460 Feet

25th Ave

*Mississippi River Elevation = 330.97



Legend

- Monitoring Well Location
- Groundwater Contour (0.25 Ft. Interval)
- Inferred Groundwater Contour (0.25 Ft. Interval)
- Groundwater Flow Direction
- 348.37 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging June 26, 2023
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Desiginated Wells not used in contoruing
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. Contours are dashed where inferred
7. BING Imagery, 2022

Figure 8: Second Quarter 2023 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

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Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

DRAWN BY: ECLW

Power Plant Rd

N

APW-01R
329.41

APW-05R
327.69

APW-02
327.8

APW-04
329.41

327.75

329.25

329.5

APW-06S
328.2

APW-06D
328.59

329

APW-03
329.34

APW-09
329.84

329.75

328

328.75

328.5

APW-07
328.52

328.25

APW-08
329.62

Mississippi River

*Mississippi River
Elevation = 327.73

APW-10D
329.96

APW-10S
328.29

0 250 500 Feet

25th Ave

N

0 0.425 0.85 Miles

Legend

- Monitoring Well Location
- Groundwater Contour (0.25 Ft. Interval) - Dashed where inferred
- Groundwater Flow Direction
- 348.37 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging September 19, 2023
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Designated Wells not used in contouring
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. Contours are dashed where inferred
7. BING Imagery, 2022

Figure 9: Third Quarter 2023 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

Environmental Resources Management
www.erm.com

Source: Esri - World Topographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

FILE: M:\US\Projects\G-L\Grand Tower Energy Center\GrandTower_IL_MXDPRO\GroundwaterContour_SEPT2023.aprx | REVISED: 01/25/2024 | SCALE: 1:3,400 when printed at 11x17

DRAWN BY: ECLW

Power Plant Rd

N

APW-01R
330.47

330.25

APW-05R
329.04

APW-02
328.90

329

329.25

329.5

APW-06S
329.50

329.75

APW-06D
329.86

APW-03
329.99

APW-04
330.19

APW-09
330.03

APW-07
329.61

329.75

APW-08
330.28

330

Mississippi River

329.75

*Mississippi River
Elevation = 328.84

APW-10D
330.36

APW-10S
329.47

0 250 500 Feet

25th Ave

0 0.425 0.85 Miles

Legend

- Monitoring Well Location
- Groundwater Contour (0.25 Ft. Interval) - Dashed where inferred
- Groundwater Flow Direction
- 328.84 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging November 27, 2023
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Designated Wells not used in contouring
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. Contours are dashed where inferred
7. BING Imagery, 2022

Figure 10: Fourth Quarter 2023 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

Environmental Resources Management
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Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

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TABLE

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-1R-20170907	APW-1R-20170927	APW-1R-20171018	APW-1R-20171108	APW-1R-20171127	APW-1R-20171228	APW-1R-20180117	APW-1R-20180207	APW-1R-WG-20220615	APW-01R-WG-20220915	APW-01R-WG-20221130	APW-01R-WG-20230202	APW-01R-WG-20230627	APW-01R-WG-20230920	APW-01R-WG-20231129
			Location ID	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R
			Sample Date	09/05/2017	09/27/2017	10/18/2017	11/08/2017	11/27/2017	12/28/2017	01/17/2018	02/07/2018	06/15/2022	09/15/2022	11/30/2022	02/02/2023	06/27/2023	09/20/2023	11/29/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.15	0.17	0.16	0.12	0.14	0.15	0.18	0.16	0.21	0.15	0.18	0.17	0.14	0.17	0.17
Radium-226	N	pCi/L	NS	0.25 ± .12 U	0.18 ± .09 U	0.307 ± .320	0.13 ± 0.43 U	-0.07 ± 0.16 U	0.23 ± 0.1 U	0.03 ± 0.07 U	-0.04 ± 0.08 U	0.0323 ± 0.141 U	0.24 ± 0.1 U	0.4 ± 0.12 U	0.16 ± 0.169 J	0.27 ± 0.11 U	0.32 ± 0.11 U	0.24 ± 0.08 U
Radium-228	N	pCi/L	NS	2.29 ± .98	0.51 ± .39 U	0.12 ± .332	0.57 ± 0.33 U	0.47 ± 0.54 U	0.04 ± 0.34 U	0.98 ± 0.62 J	0.22 ± 0.34 U	0.661 ± 0.257	0.43 ± 0.49 UQM-	0.41 ± 0.56 U	0.531 ± 0.284	0.85 ± 0.61 J	0.32 ± 0.56 U	0.97 ± 0.67 J
Sulfate	N	mg/L	400	41	65	65	54	58	88	78	79	33	73 S	69	74	37	79	73
CALC																		
Radium-226/228	N	pCi/L	5									0.693 ± 0.293	0.67 ± 0.59 U	0.81 ± 0.68 U	0.691 ± 0.330	1.12 ± 0.72 U	0.64 ± 0.67 U	1.21 ± 0.75 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									33.9	31.7	31.7	89.5	83.2	133	95.6
GEN CHEM																		
Chloride	N	mg/L	200	5 U	5 U	5 U	5 U	5 U	9	11	10	2	7	7	7	4 U	5	7
Dissolved Solids, Total	N	mg/L	1200	400	428	376	358 R	412	474	434	392	342	420 H	385	384	328	355	300
pH, Lab	N	pH units	6.22-9.0[2]	6.64	6.54	6.6	6.8	7.11	6.96	7.09	6.52	6.98	6.91	6.43	6.57	6.53 H	6.66 H	6.59 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0012	0.001 U	0.001 U	0.001	0.0011	0.0016	0.0015
Arsenic	T	mg/L	0.01	0.0012	0.0012	0.001 U	0.0012	0.0011	0.001 U	0.0011	0.0011	0.0019	0.0019	0.0021	0.0016	0.0013	0.0029	0.0033
Barium	D	mg/L	2									0.16	0.153	0.162 B	0.155	0.164	0.21	0.245
Barium	T	mg/L	2	0.168	0.193	0.171	0.176	0.165	0.178	0.182	0.18	0.197	0.185	0.199	0.178	0.168	0.202	0.259
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									0.163	0.244	0.219	0.205	0.249	0.204	0.279
Boron	T	mg/L	2	0.218	0.251	0.238	0.211	0.225	0.329	0.357	0.311	0.228	0.242	0.222	0.221	0.176	0.18	0.263
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									85.6	83.8 S	73.9	71.4	66.4	72.1	57.6
Calcium	T	mg/L	103.2[3]	84.3 S	93 S	86.2 S	88.2	91.2 S	91	97.1	85.8 S	90.3	91.4	79.7	75.5 S	66.8 B	59.2 S	94.3
Chromium	D	mg/L	0.1									0.0009 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0023	0.0021	0.0033	0.001 U	0.001 U	0.0018	0.0015	0.0015	0.0031	0.0034	0.0041	0.0022	0.0015 U	0.0085	0.0049
Cobalt	D	mg/L	0.006									0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0012	0.0013
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0017	0.0017	0.0031	0.0013	0.0014	0.0041	0.0027
Iron	T	mg/L	NS									1.42						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.0062	0.0014	0.001 U	0.001 U	0.0026	0.002
Lithium	D	mg/L	0.04									0.0127	0.0156	0.0139	0.0135	0.015	0.0211	0.0193
Lithium	T	mg/L	0.04	0.0155	0.018	0.0173	0.0175	0.018	0.0179	0.0164	0.0159	0.0171	0.0169	0.0155	0.0157	0.0142	0.0147	0.0189
Manganese	T	mg/L	NS									0.139						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Molybdenum	T	mg/L	0.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Nickel	D	mg/L	NS									0.0043		0.0061				
Nickel	T	mg/L	NS	0.0044	0.0062	0.0054	0.004	0.0038	0.0046	0.005	0.0057	0.0083		0.012				
Selenium	D	mg/L	0.05									0.0028	0.0032	0.0033	0.0032	0.0032	0.0037	0.0058
Selenium	T	mg/L	0.05	0.0038	0.004	0.0034	0.0044	0.0041	0.004	0.004	0.0037	0.0028	0.0038	0.0035	0.0037	0.0033	0.0037	0.0054
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0014	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR impoundment								Post-Closure Sampling										
			Sample ID	APW-2-20170907	APW-2-20170927	APW-2-20171020	APW-2-20171109	APW-2-20171129	APW-2-20171227	APW-2-20180119	APW-2-20180207	APW-02-WG-20220616	APW-02-WG-20220914	DUP-002-WG-20220916	APW-02-WG-20221129	DUP-02-WG-20221129	APW-02-WG-20230201	DUP-02-WG-20230201	APW-02-WG-20230627	DUP-02-WG-20230627	APW-02-WG-20230920	APW-02-WG-20231128
			Location ID	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02
			Sample Date	09/06/2017	09/28/2017	10/20/2017	11/09/2017	11/29/2017	12/27/2017	01/19/2018	02/07/2018	06/16/2022	09/14/2022	09/14/2022	11/29/2022	11/29/2022	02/01/2023	02/01/2023	06/27/2023	06/27/2023	09/20/2023	11/28/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	FD	N	FD	N	N
Parameter/Analyte	Total or Dissolved	Units	35 IAC 845.600																			
UNSPECIFIED																						
Fluoride	N	mg/L	4	0.24	0.26	0.25	0.24	0.24	0.25	0.26	0.24	0.25	0.22	0.22	0.25	0.26	0.23	0.22	0.22	0.22	0.24	0.26
Radium-226	N	pCi/L	NS	1.06 ± 0.21	0.03 ± 0.1 U	-0.132 ± 0.410	1.47 ± 0.25		0.33 ± 0.12 U	0.47 ± 0.15 U	0.97 ± 0.23 J	0.159 ± 0.181 J	0.27 ± 0.1 UJDR	0.14 ± 0.07 U	0.5 ± 0.14 U	0.35 ± 0.12 U	0.0737 ± 0.256 U	0.175 ± 0.279 J	0.21 ± 0.1 U	-0.05 ± 0.07 U	0.38 ± 0.12 U	0.12 ± 0.06 U
Radium-228	N	pCi/L	NS	1.98 ± 0.95	-0.01 ± 0.6 U	0.504 ± 0.378	0.91 ± 0.36 J		0.95 ± 0.52 J	1.08 ± 0.59	0.99 ± 0.5 J	0.308 ± 0.236 JSU	0.4 ± 0.48 UJDR	2.81 ± 1.03	0.24 ± 0.44 U	0.27 ± 0.55 U	1.07 ± 0.466	0.981 ± 0.290	-0.42 ± 0.6 U	0.13 ± 0.52 U	3.71 ± 0.93	0.56 ± 0.64 U
Sulfate	N	mg/L	400	462	460	472 S	479	472	426	443	416	496	491	490	419	438	459	455	500	465	460	440
CALC																						
Radium-226/228	N	pCi/L	5									0.467 ± 0.297 J	0.67 ± 0.58 U	2.95 ± 1.1	0.74 ± 0.58 U	0.62 ± 0.67 U	1.14 ± 0.532	1.16 ± 0.402	0.21 ± 0.7 U	0.13 ± 0.59 U	4.09 ± 1.05	0.68 ± 0.7 U
FIELD PARAM																						
Turbidity, Field	N	NTU	17.96[1]									38	19.2		132		93.6		104.3		97	169
GEN CHEM																						
Chloride	N	mg/L	200	13	12	11	11	12	12	12	12	9	11	10	9	9	10	10	7	8	7	8
Dissolved Solids, Total	N	mg/L	1200	858	880	934	916	870	848	836	888	930	890 H	905 H	885	855	852	886	920	870	845	926
pH, Lab	N	pH units	6.22-9.0[2]	7.09	7.05	7.08	7.07	7.05	7.14	7.06	6.96	7.21	7.32	7.25	7.01	7.02	6.98	7.05	6.9 H	7.03 H	7.15 H	7.11 H
METALS																						
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0021	0.0009 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0117	0.0048	0.0049	0.0012	0.0187	0.016	0.0138	0.011	0.0107	0.0072	0.0118
Arsenic	T	mg/L	0.01	0.0199	0.0147	0.0212	0.017	0.0169	0.0157	0.0148	0.0243	0.0158	0.026	0.0176	0.022	0.0173	0.0185	0.0175	0.0148	0.0146	0.0093	0.0237
Barium	D	mg/L	2									0.154	0.123	0.135	0.126 B	0.148 B	0.187	0.154	0.142	0.145	0.131	0.205
Barium	T	mg/L	2	0.479	0.355	0.685	0.44	0.427	0.338	0.351	0.739	0.257	0.408	0.238	0.254	0.218	0.214	0.159	0.149	0.206	0.152	0.303
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.002 U	0.001 U	0.001 U	0.001 SU	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									8.17	7.48 S	7.9	8.658	8.63	9.21	7.39	8.97	9.24	8.91	9.57 S
Boron	T	mg/L	2	8.16	8.73	8.94 S	9	8.98	8.39	8.19	8.24	8.13	8.43	8.72	8.87 S	7.49	7.75	8.32 S	9.14	9.31 S	8.24	9.62
Cadmium	D	mg/L	0.005									0.0003 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									175	136 S	165	96.1	129	108	144	147	148	151	121 S
Calcium	T	mg/L	103.2[3]	148	145	171 S	157	158	135	134	175	189	168	178	146 S	149	144	149 S	161 R	167 S	132	132
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0374	0.0455	0.0503	0.0235	0.014	0.0566	0.127	0.112	0.0254	0.0148	0.0266	0.0264	0.0254	0.0052	0.0022	0.0014	0.0079	0.008	0.0092
Cobalt	D	mg/L	0.006									0.0003 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.0057	0.0023	0.0097	0.0041	0.0038	0.0018	0.0028	0.011	0.0011 J	0.0044	0.0011	0.0015	0.0011	0.001 U	0.001 U	0.001 U	0.0018	0.001 U	0.0027
Iron	T	mg/L	NS									11.7										
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.0115	0.0054	0.0201	0.0096	0.0075	0.0031	0.0048	0.0239	0.0022	0.0119	0.0033	0.0033	0.0034	0.0027	0.0023	0.0025	0.0029	0.002	0.0057
Lithium	D	mg/L	0.04									0.037	0.0374	0.0404	0.028	0.0356	0.0425	0.0387	0.0442	0.0455	0.0583	0.0506
Lithium	T	mg/L	0.04	0.05	0.0455	0.0647	0.0521	0.0542	0.0474	0.045	0.0604	0.0507	0.0559	0.0456	0.0386	0.0411	0.0417	0.044	0.0459	0.048	0.0422	0.056
Manganese	T	mg/L	NS									0.752										
Mercury	D	mg/L	0.002										0.0002 U	0.0002 U								
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.00043	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.201	0.139	0.158	0.0317	0.145	0.153	0.155	0.227	0.227	0.214	0.205
Molybdenum	T	mg/L	0.1	0.172	0.147	0.214	0.175	0.165	0.111	0.0951	0.131	0.24	0.174	0.174	0.129	0.113	0.165	0.18	0.229	0.252	0.158	0.147
Nickel	D	mg/L	NS									0.0039			0.0022	0.001 U						
Nickel	T	mg/L	NS	0.0288	0.0263	0.0412	0.0202	0.0135	0.0295	0.0631	0.0725	0.0142			0.0045	0.0047						
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = piccocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-3-20170907	APW-3-20170929	APW-3-20171020	APW-3-20171110	APW-3-20171129	APW-3-20171228	APW-3-20180119	APW-3-20180208	APW-03-WG-20220616	APW-03-WG-20220915	APW-03-WG-20221130	APW-03-WG-20230130	APW-03-WG-20230626	APW-03-WG-20230919	APW-03-WG-20231127
			Location ID	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03
			Sample Date	09/06/2017	09/29/2017	10/20/2017	11/10/2017	11/29/2017	12/28/2017	01/19/2018	02/08/2018	06/16/2022	09/15/2022	11/30/2022	01/30/2023	06/26/2023	09/19/2023	11/27/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.28	0.29	0.29	0.31	0.27	0.29	0.29	0.34	0.26	0.2	0.26	0.23	0.23	0.25	0.24
Radium-226	N	pCi/L	NS	0.53 ± .18 U	0.04 ± 0.09 U	0.409 ± 0.426	0.18 ± 0.11 U	0.33 ± 0.17 U	0.2 ± 0.1 U	0.1 ± 0.1 U	0.31 ± 0.15 U	0.201 ± 0.155	0.56 ± 0.13 U	0.19 ± 0.1 U	0.293 ± 0.212	0.23 ± 0.11 U	0.2 ± 0.09 U	0.11 ± 0.05 U
Radium-228	N	pCi/L	NS	2.05 ± .96	1.01 ± 0.57	0.492 ± 0.373	0.72 ± 0.37 J	0.31 ± 0.49 U	0.37 ± 0.44 U	1.32 ± 0.68	0.06 ± 0.36 U	1.89 ± 0.26 J3	0.4 ± 0.5 UJDR	0.67 ± 0.59 U	0.119 ± 0.430 U	0.61 ± 0.54 U	0.85 ± 0.52 J	0.66 ± 0.58 JQDR
Sulfate	N	mg/L	400	175	222	201	207	204	168	152	194	393	150	226	322	292	280	133
CALC																		
Radium-226/228	N	pCi/L	5									2.09 ± 0.303	0.96 ± 0.63 U	0.86 ± 0.69 U	0.412 ± 0.479 J	0.84 ± 0.65 U	1.05 ± 0.61 U	0.77 ± 0.63 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									40.3	56.1	103	50.7	6.04	2.72	4
GEN CHEM																		
Chloride	N	mg/L	200	22	21	21	22	19	20	16	23	20	16	20	21	17	16	11
Dissolved Solids, Total	N	mg/L	1200	464	514	486	450	554	504	498	456	724	602 H	610	524	614	636	556
pH, Lab	N	pH units	6.22-9.0[2]	7.88	7.46	7.65	7.93	7.5	7.48	7.26	7.78	7.85	7.46	7.21	7.45	7.77 H	7.84 H	7.24 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0018
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0015	0.0014	0.0024	0.002	0.0016	0.0019	0.0013
Arsenic	T	mg/L	0.01	0.0022	0.0029	0.0021	0.0018	0.0023	0.0024	0.0028	0.0018	0.002	0.0046	0.0059	0.003	0.004	0.0017	0.002
Barium	D	mg/L	2									0.139	0.124	0.108 B	0.139	0.13	0.136	0.122
Barium	T	mg/L	2	0.111	0.146	0.104	0.0814	0.121	0.1	0.15	0.0806	0.158	0.181	0.19	0.135	0.155	0.137	0.167
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									4.23	1.49	2.99	4.98	4.64	4.11	1.69
Boron	T	mg/L	2	4.16	4.21 S	4.7	4.67	4.44 S	4.52	4.08	4.92	4.27	1.84	3.59	4.94	4.67	4.19 S	2.22
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									174	125	101	121	125	137	111
Calcium	T	mg/L	103.2[3]	86.3	104 S	88.1	74.9	116 S	95	101	77.1	153	143	115	111	139 B	124 S	115
Chromium	D	mg/L	0.1									0.0011 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0081	0.0053	0.0026	0.001 U	0.001 U	0.005	0.0025	0.001 U	0.0044	0.0083	0.0118	0.0019	0.0241	0.0015 U	0.0015 U
Cobalt	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.001 U	0.0015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 J	0.0014	0.0021	0.001 U	0.0014	0.001 U	0.001 U
Iron	T	mg/L	NS									1.66						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.0021	0.0042	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.0023	0.0029	0.001 U	0.0044	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0338	0.0288	0.0266	0.0275	0.0262	0.0456	0.0256
Lithium	T	mg/L	0.04	0.0258	0.0262	0.0259	0.0245	0.0308	0.027	0.035	0.0239	0.0361	0.0329	0.029	0.0276	0.0352	0.0312	0.0324
Manganese	T	mg/L	NS									0.321						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.057	0.0342	0.0648	0.0521	0.0656	0.0487	0.0303
Molybdenum	T	mg/L	0.1	0.0778	0.0754	0.0761	0.0713	0.0684	0.0748	0.0824	0.0849	0.0601	0.0413	0.0621	0.0528	0.0553	0.0558	0.0319
Nickel	D	mg/L	NS									0.0016		0.0011				
Nickel	T	mg/L	NS	0.0055	0.0051	0.0019	0.001 U	0.001 U	0.0026	0.0025	0.001	0.0033		0.01				
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0012
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0019
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-4-20170907	APW-4-20170929	APW-4-20171019	APW-4-20171108	APW-4-20171128	APW-4-20171228	APW-4-20180119	APW-4-20180208	APW-04-WG-20220615	APW-04-WG-20220915	APW-04-WG-20221128	APW-04-WG-20230202	APW-04-WG-20230627	APW-04-WG-20230920	APW-04-WG-20231129
			Location ID	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04
			Sample Date	09/08/2017	09/29/2017	10/19/2017	11/08/2017	11/28/2017	12/28/2017	01/19/2018	02/08/2018	06/15/2022	09/15/2022	11/28/2022	02/02/2023	06/27/2023	09/20/2023	11/29/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	Total or Dissolved	Units	35 IAC 845.600															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.18	0.19	0.18	0.17	0.18	0.17	0.17	0.16	0.2	0.17	0.17	0.15	0.16	0.15	0.18
Radium-226	N	pCi/L	NS	0.38 ± 0.16 U	0.02 ± 0.08 U	-0.272 ± 0.328	0.15 ± 0.09 U	0.09 ± 0.13 U	0.17 ± 0.09 U	-0.05 ± 0.08 U	0.13 ± 0.11 U	0.103 ± 0.164 J	0.5 ± 0.13 U	0.11 ± 0.08 U	0.352 ± 0.232	0.33 ± 0.12 U	0.09 ± 0.07 U	0.19 ± 0.07 U
Radium-228	N	pCi/L	NS	0.95 ± 0.64 J	-0.45 ± 0.68 U	0.53 ± 0.382	0.64 ± 0.31 U	0.88 ± 0.64 J	0.73 ± 0.36 J	0.34 ± 0.51 U	0.64 ± 0.48 U	0.245 ± 0.235 J	2.15 ± 0.78	1.47 ± 0.67	0.961 ± 0.296	0.92 ± 0.68 J	1.18 ± 0.67	0.66 ± 0.64 J
Sulfate	N	mg/L	400	126	116	109	120	107	100	99	92	94	83	68	62	65	66	54
CALC																		
Radium-226/228	N	pCi/L	5									0.348 ± 0.287 J	2.65 ± 0.91	1.58 ± 0.75 U	1.31 ± 0.376	1.25 ± 0.8 U	1.27 ± 0.74 U	0.85 ± 0.71 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									19.1	18.3	26.5	37.3	38.7	21.6	22.8
GEN CHEM																		
Chloride	N	mg/L	200	12	11	11	11	11	11	10	11	12	10	11	10	12	9	11
Dissolved Solids, Total	N	mg/L	1200	460	484	452	472	492	514	424	528	430	436 H	446	416	432	476	430
pH, Lab	N	pH units	6.22-9.0[2]	7.31	7.33	7.31	7.42	7.32	7.33	7.25	7.2	7.41	7.51	7.34	7.21	7.39 H	7.56 H	7.31 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0013	0.0013	0.0021	0.0011	0.0014	0.0016	0.002
Arsenic	T	mg/L	0.01	0.0025	0.0018	0.0016	0.0018	0.0016	0.0014	0.0016	0.0015	0.0015	0.0029	0.0016	0.0017	0.002	0.0019	0.0028
Barium	D	mg/L	2									0.116	0.132	0.13 B	0.116	0.122	0.138	0.165
Barium	T	mg/L	2	0.145	0.139	0.123	0.13	0.128	0.141	0.155	0.144	0.143	0.165	0.133	0.134	0.138	0.131	0.153
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									1.41	0.875	7.33	0.619	0.908	0.591	0.645
Boron	T	mg/L	2	2.37	2.16	2.12	2.21	2.03	1.7	1.33	1.18	1.88	0.973	0.653	0.65	0.876	0.572	0.559
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									111	93.7	108	93.3 S	88.3	101 S	77.9
Calcium	T	mg/L	103.2[3]	101 S	105	89.4	97.5	107	107	113	113	97.8	108 S	102	100	97.5 B	87.9	124
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0041	0.0025	0.0017	0.001 U	0.001 U	0.0027	0.0037	0.001 U	0.0015 U	0.0251	0.0043	0.0016	0.0015 U	0.0023	0.0033
Cobalt	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.0013	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0006 J	0.0025	0.001 U	0.001 U	0.001 U	0.001 U	0.0012
Iron	T	mg/L	NS									0.563						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0016	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0264	0.0283	0.0355	0.0292	0.0311	0.0411	0.0333
Lithium	T	mg/L	0.04	0.0404	0.0403	0.0412	0.0406	0.0424	0.0416	0.0411	0.0397	0.036	0.0322	0.0293	0.0326	0.0314	0.0299	0.0298
Manganese	T	mg/L	NS									0.192						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0653	0.0445	0.227	0.0383	0.0503	0.0367	0.0461
Molybdenum	T	mg/L	0.1	0.0891	0.084	0.0793	0.0812	0.0748	0.0714	0.0592	0.057	0.0788	0.0494	0.0406	0.0377	0.0449	0.0299	0.0347
Nickel	D	mg/L	NS									0.0019		0.0017				
Nickel	T	mg/L	NS	0.0065	0.0034	0.0029	0.002	0.002	0.0026	0.0039	0.003	0.0045		0.0051				
Selenium	D	mg/L	0.05									0.0134	0.0101	0.001 U	0.009	0.0165	0.0096	0.0139
Selenium	T	mg/L	0.05	0.0158	0.015	0.0149	0.0161	0.014	0.013	0.0101	0.0102	0.0133	0.0111	0.0085	0.0099	0.0165	0.009	0.015
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
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NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
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Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

Sampled prior to closure of CCR Impoundment

Parameter/Analyte	Total or Dissolved	Units	35 IAC 845.600	APW-5-20170907 APW-05 09/06/2017 N	APW-5-20170928 APW-05 09/28/2017 N	APW-5-20171019 APW-05 10/19/2017 N	APW-5-20171109 APW-05 11/09/2017 N	APW-5-20171129 APW-05 11/29/2017 N	APW-5-20171227 APW-05 12/27/2017 N	APW-5-20180118 APW-05 01/18/2018 N	APW-5-20180207 APW-05 02/07/2018 N
UNSPECIFIED											
Fluoride	N	mg/L	4	0.34	0.34	0.32	0.32	0.32	0.33	0.36	0.32
Radium-226	N	pCi/L	NS	0.37 ± 0.14 U	0.19 ± 0.1 U	0.133 ± 0.370	0.48 ± 0.15 U		0.35 ± 0.12 U	0.13 ± 0.1 U	0.26 ± 0.13 U
Radium-228	N	pCi/L	NS	1.07 ± 0.8	0.89 ± 0.55 J	0.661 ± 0.418	1.17 ± 0.33		0.49 ± 0.42 U	1.04 ± 0.56	0.35 ± 0.4 U
Sulfate	N	mg/L	400	**407**	**460**	399	**413**	381	394	**439**	378
CALC											
Radium-226/228	N	pCi/L	5								
FIELD PARAM											
Turbidity, Field	N	NTU	17.96[1]								
GEN CHEM											
Chloride	N	mg/L	200	15	15	15	14	16	16	16	16
Dissolved Solids, Total	N	mg/L	1200	842	832	804	826	790	792	552	804
pH, Lab	N	pH units	6.22-9.0[2]	7.37	7.3	7.26	7.3	7.26	7.31	7.23	7.18
METALS											
Antimony	D	mg/L	0.006								
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01								
Arsenic	T	mg/L	0.01	0.0031	0.0026	0.0015	0.0016	0.0016	0.0019	0.0021	0.0019
Barium	D	mg/L	2								
Barium	T	mg/L	2	0.226	0.233	0.183	0.216	0.193	0.214	0.214	0.195
Beryllium	D	mg/L	0.004								
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2								
Boron	T	mg/L	2	**9.3**	**10.3**	**8.89**	**9.98**	**9.1**	**9.83**	**9.25**	**8.73**
Cadmium	D	mg/L	0.005								
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[1]								
Calcium	T	mg/L	103.2[1]	**136**	**142**	**119**	**131**	**123**	**125**	**121**	**124**
Chromium	D	mg/L	0.1								
Chromium	T	mg/L	0.1	0.0137	0.001 U	0.0041	0.001 U	0.001 U	0.0084	0.0033	0.001 U
Cobalt	D	mg/L	0.006								
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Iron	T	mg/L	NS								
Lead	D	mg/L	0.0075								
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04								
Lithium	T	mg/L	0.04	0.0363	**0.0443**	0.0393	**0.0405**	**0.0415**	**0.0433**	**0.0404**	0.0397
Manganese	T	mg/L	NS								
Mercury	D	mg/L	0.002								
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1								
Molybdenum	T	mg/L	0.1	**0.172**	**0.195**	**0.201**	**0.168**	**0.193**	**0.246**	**0.244**	**0.249**
Nickel	D	mg/L	NS								
Nickel	T	mg/L	NS	0.0074	0.0012	0.0023	0.001 U	0.001 U	0.0043	0.0021	0.001 U
Selenium	D	mg/L	0.05								
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002								
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U

Post-Closure Sampling

Parameter/Analyte	Total or Dissolved	Units	35 IAC 845.600	APW-05-WG-20220616 APW-05 06/16/2022 N	DUP-001-WG-20220616 APW-05 06/16/2022 FD	APW-05-WG-20220914 APW-05 09/14/2022 N	DUP-001-WG-20220914 APW-05 09/14/2022 FD	APW-05-WG-20221128 APW-05 11/28/2022 N	DUP-01-WG-20221128 APW-05 11/28/2022 FD	APW-05-WG-20230201 APW-05 02/01/2023 N	DUP-01-WG-20230201 APW-05 02/01/2023 FD	APW-05R-WG-20230627 APW-05 06/27/2023 N	DUP-01-WG-20230627 APW-05 06/27/2023 FD	APW-05R-WG-20230920 APW-05 09/20/2023 N	DUP-01-WG-20230920 APW-05 09/20/2023 FD	APW-05R-WG-20231128 APW-05R 11/28/2023 N	DUP-01-WG-20231128 APW-05R 11/28/2023 FD
UNSPECIFIED																	
Fluoride	N	mg/L	4	0.35	0.33	0.33	0.31	0.37	0.38	0.33	0.33	0.3	0.32	0.35	0.34	0.38	0.35
Radium-226	N	pCi/L	NS	0.649 ± 0.316	0.259 ± 0.27 J	0.17 ± 0.08 U	0.11 ± 0.07 U	0.11 ± 0.11 U	0.17 ± 0.08 U	0.209 ± 0.245 J	0.205 ± 0.241 J	0.23 ± 0.1 U	0.11 ± 0.08 U	0.49 ± 0.13 U	0.36 ± 0.13 U	0.15 ± 0.06 U	0.05 ± 0.04 U
Radium-228	N	pCi/L	NS	1.1 ± 0.282	0.715 ± 0.31	0.82 ± 0.88 J	0.27 ± 0.55 U	0.49 ± 0.49 U	1.24 ± 0.71	0.399 ± 0.422 J	0.249 ± 0.228 J	0.31 ± 0.5 UQDR	0.61 ± 0.67 U	5.85 ± 1.14 *	0.42 ± 0.71 U	0.73 ± 0.57 J	0.75 ± 0.67 J
Sulfate	N	mg/L	400	224	239	379	**403**	324	338	325	305	335	326	343	333	330	321
CALC																	
Radium-226/228	N	pCi/L	5	1.75 ± 0.424	0.973 ± 0.411	0.99 ± 0.96 U	0.38 ± 0.62 U	0.6 ± 0.6 U	1.41 ± 0.79 U	0.608 ± 0.488 J	0.454 ± 0.332 J	0.54 ± 0.6 U	0.72 ± 0.75 U	6.34 ± 1.53	0.78 ± 0.84 U	0.88 ± 0.63 U	0.8 ± 0.71 U
FIELD PARAM																	
Turbidity, Field	N	NTU	17.96[1]	**51.8**		9.19		4.65		8.21		**42.6**		**33.7**		**76.1**	
GEN CHEM																	
Chloride	N	mg/L	200	19	19	15	15	19	19	18	18	17	18	14	14	16	16
Dissolved Solids, Total	N	mg/L	1200	650	690	750 H	774 H	714	728 H	696	670	740	695	680	710	705	690
pH, Lab	N	pH units	6.22-9.0[2]	7.35	7.49	7.55	7.57	7.24	7.27	7.31	7.33	7.27 H	7.3 H	7.36 H	7.36 H	7.33 H	7.34 H
METALS																	
Antimony	D	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 SU
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01	0.002	0.0021	0.001	0.001	0.001 U	0.0019	0.0026	0.0018	0.0024	0.0025	0.0023	0.0024	0.0029	0.0018
Arsenic	T	mg/L	0.01	0.0048	0.0041	0.0025	0.0023	0.0022	0.0023	0.0024	0.0025	0.003	0.003	0.0028	0.0026	0.0042	0.0031
Barium	D	mg/L	2	0.133	0.132	0.13	0.128	0.172 B	0.13 B	0.175	0.135	0.168	0.167	0.167	0.172	0.186	0.127
Barium	T	mg/L	2	0.187	0.174	0.154	0.152	0.14	0.136	0.145	0.148	0.183	0.181	0.162	0.158	0.225	0.158
Beryllium	D	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2	**7.63**	**7.7**	**7.42**	**7.09**	**6.12**	**7.03 S**	**8.68 S**	**6.76**	**8.64**	**8.37**	**7.91**	**8.05**	**8.71**	**6.44 S**
Boron	T	mg/L	2	**7.67**	**8.24 S**	**7.76**	**7.62**	**7.48**	**7.97**	**7.35**	**7.59**	**8.76**	**8.68**	**7.12**	**8.33 S**	**9.62**	**6.77**
Cadmium	D	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[1]	**139**	**141**	**119**	**131**	87.4	**110 S**	**106 S**	**111**	**120**	**120**	**118**	**119**	98.4	91.9 S
Calcium	T	mg/L	103.2[1]	**127**	**129 S**	**127**	**137**	**117**	**118**	**112**	**114**	**136 B**	**133 B**	**105**	**126 S**	97.1	**134**
Chromium	D	mg/L	0.1	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 SU
Chromium	T	mg/L	0.1	0.0016 J	0.003 U	0.0015 U	0.0015 U	0.0015 U	0.0016	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0031	0.0016	0.002	0.0023
Cobalt	D	mg/L	0.006	0.0006 J	0.0005 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 SU
Cobalt	T	mg/L	0.006	0.0013 J	0.0011 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Iron	T	mg/L	NS	2.77	1.89												
Lead	D	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.001	0.0026	0.0021	0.002	0.0014
Lithium	D	mg/L	0.04	0.0282	0.029	0.0381	0.0373	0.0338	0.0365	**0.045**	0.0375	0.0384	0.0398	**0.0624**	**0.0509**	**0.0455**	0.0343
Lithium	T	mg/L	0.04	0.0331	0.0363	**0.0408**	0.0397	0.0373	0.0371	0.0399	**0.0402**	**0.0423**	**0.0415**	0.0367	**0.0425**	**0.0523**	0.0371
Manganese	T	mg/L	NS	0.9	0.904												
Mercury	D	mg/L	0.002			0.0002 U	0.0002 U										
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1	**0.172**	**0.17**	**0.213**	**0.206**	**0.293**	**0.211 S**	**0.187**	**0.199**	**0.213**	**0.204**	**0.235**	**0.233**	**0.282**	**0.192**
Molybdenum	T	mg/L	0.1	**0.203**	**0.195**	**0.235**	**0.224**	**0.223**	**0.226**	**0.217**	**0.212**	**0.212**	**0.21**	**0.223**	**0.235**	**0.203**	**0.215**
Nickel	D	mg/L	NS	0.0036	0.0035			0.0011	0.0024								
Nickel	T	mg/L	NS	0.0037	0.0039			0.002	0.0029								
Selenium	D	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-6D-20170907	APW-6D-20170927	APW-6D-20171019	APW-6D-20171109	APW-6D-20171128	APW-6D-20171227	APW-6D-20180118	APW-6D-20180208	N/A	APW-06D-WG-20220913	APW-06D-WG-20221128	APW-06D-WG-20230201	APW-06D-WG-20230627	APW-06D-WG-20230920	APW-06D-WG-20231128
			Location ID	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D
			Sample Date	09/06/2017	09/28/2017	10/19/2017	11/09/2017	11/28/2017	12/27/2017	01/18/2018	02/08/2018	6/16/2022	09/13/2022	11/28/2022	02/01/2023	06/27/2023	09/20/2023	11/28/2023
			Sample Type	N	N	N	N	N	N	N	N	Casing deflected, no sample collected during Q2 202	N	N	N	N	N	N
Parameter/Analyte	Total or Dissolved	Units	35 IAC 845.600															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.22	0.23	0.21	0.22	0.21	0.22	0.23	0.21	N/A	0.2	0.24	0.21	0.2	0.22	0.24
Radium-226	N	pCi/L	NS	0.62 ± 0.17 U	0.37 ± 0.11 U	1.22 ± 0.744	0.39 ± 0.15 U	0.38 ± 0.18 U	0.3 ± 0.12 U	0.03 ± 0.08 U	0.2 ± 0.13 U	N/A	0.31 ± 0.1 U	0.62 ± 0.15 U	0.355 ± 0.275	0.3 ± 0.12 U	0.18 ± 0.09 U	0.11 ± 0.05 U
Radium-228	N	pCi/L	NS	1.07 ± 0.65	0.61 ± 0.33 U	0.549 ± 0.377	0.86 ± 0.37 J	1.4 ± 0.71	0.79 ± 0.48 J	0.74 ± 0.57 J	0.24 ± 0.34 U	N/A	1.46 ± 0.71	0.28 ± 0.43 U	1.02 ± 0.451	0.74 ± 0.54 J	2.62 ± 0.76	0.76 ± 0.6 J
Sulfate	N	mg/L	400	215	228	206	222	230	236	211	189	N/A	272	254	269	270	218	184
CALC																		
Radium-226/228	N	pCi/L	5									N/A	1.77 ± 0.81 U	0.9 ± 0.58 U	1.38 ± 0.528	1.04 ± 0.66 U	2.8 ± 0.85	0.87 ± 0.65 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									N/A	18.5	74.4	26.9	181	65.5	3.02
GEN CHEM																		
Chloride	N	mg/L	200	17	17	16	16	16	16	17	17	N/A	14	17	16	15	16	22
Dissolved Solids, Total	N	mg/L	1200	558	560	562	564	590	516 R	482	584	N/A	670 H	580	582	735	565	560
pH, Lab	N	pH units	6.22-9.0[2]	7.23	7.25	7.23	7.19	7.2	7.22	7.21	7.2	N/A	7.42	7.21	7.29	7.39 H	7.3 H	7.36 H
METALS																		
Antimony	D	mg/L	0.006									N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									N/A	0.004	0.0116	0.012	0.0102	0.01	0.0161
Arsenic	T	mg/L	0.01	0.0068	0.0101	0.0075	0.0074	0.009	0.0095	0.0106	0.0096	N/A	0.0104	0.0111	0.0107	0.0115	0.0109	0.0135
Barium	D	mg/L	2									N/A	0.129	0.118 B	0.152	0.13	0.121	0.185
Barium	T	mg/L	2	0.173	0.172	0.142	0.153	0.155	0.163	0.166	0.148	N/A	0.143	0.142	0.134	0.145	0.128	0.151
Beryllium	D	mg/L	0.004									N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									N/A	5.32	4.14	4.39	5.01	3.77	4.67
Boron	T	mg/L	2	3.72	3.87	3.55	3.58	3.9	3.84	3.3	3.09	N/A	5.51	4.29	3.95	4.99	3.81	3.8
Cadmium	D	mg/L	0.005									N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									N/A	118	105	109	118	114	80.3
Calcium	T	mg/L	103.2[3]	99.9	110	96.7	100	110	107	105 S	105	N/A	123	110	116	128 B	106	98.4
Chromium	D	mg/L	0.1									N/A	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.001 U	0.0013	0.001 U	0.001 U	0.001 U	0.0017	0.003	0.0014	N/A	0.0015 U	0.0063	0.0015 U	0.0057	0.0727	0.0015 U
Cobalt	D	mg/L	0.006									N/A	0.0013	0.0012	0.001	0.001 U	0.001 U	0.0012
Cobalt	T	mg/L	0.006	0.0012	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.001 U	0.0035	0.0013	0.0054	0.0035	0.0013
Lead	D	mg/L	0.0075									N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.001 U	0.0012	0.001 U	0.0016	0.001 U	0.001 U
Lithium	D	mg/L	0.04									N/A	0.0179	0.0155	0.0194	0.016	0.0197	0.0241
Lithium	T	mg/L	0.04	0.016	0.0176	0.0161	0.0163	0.0178	0.0181	0.0165	0.0162	N/A	0.0185	0.0175	0.0172	0.0184	0.0169	0.0199
Mercury	D	mg/L	0.002									N/A	0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	N/A	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									N/A	0.0669	0.0796	0.0583	0.0643	0.0559	0.0949
Molybdenum	T	mg/L	0.1	0.0646	0.0606	0.0582	0.0589	0.06	0.0584	0.0465	0.0463	N/A	0.0719	0.0696	0.0683	0.0602	0.0672	0.0557
Nickel	D	mg/L	NS									N/A		0.002				
Nickel	T	mg/L	NS	0.0032	0.0028	0.0018	0.002	0.0017	0.0022	0.0032	0.0025	N/A		0.0093				
Selenium	D	mg/L	0.05									N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002									N/A	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	N/A	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
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NTU = nephelometric turbidity units
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R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

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1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-6S-20170907	APW-6S-20170928	APW-6S-20171019	APW-6S-20171109	APW-6S-20171128	APW-6S-20171227	APW-6S-20180118	APW-6S-20180208	APW-6S-WG-20220616	APW-06S-WG-20220913	APW-06S-WG-20221128	APW-06S-WG-20230201	APW-06S-WG-20230627	APW-06S-WG-20230920	APW-06S-WG-20231128
			Location ID	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S
			Sample Date	09/06/2017	09/28/2017	10/19/2017	11/09/2017	11/28/2017	12/27/2017	01/18/2018	02/08/2018	06/16/2022	09/13/2022	11/28/2022	02/01/2023	06/27/2023	09/20/2023	11/28/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.41	0.26	0.25	0.26	0.25	0.25	0.27	0.24	0.29	0.28	0.32	0.29	0.26	0.3	0.33
Radium-226	N	pCi/L	NS	0.36 ± 0.14 U	0.09 ± 0.08 U	0.317 ± 0.331	0.22 ± 0.11 U	0.18 ± 0.13 U	0.11 ± 0.09 U	0.09 ± 0.09 U	0.15 ± 0.11 U	0.269 ± 0.182	0.2 ± 0.08 U	0.19 ± 0.09 U	0.0283 ± 0.232 U	0.11 ± 0.08 U	0.32 ± 0.11 U	0.09 ± 0.05 U
Radium-228	N	pCi/L	NS	0.56 ± 0.77 U	1.06 ± 0.53	0.481 ± 0.316	0.9 ± 0.4 J	0.92 ± 0.6 J	0.44 ± 0.44 U	0.71 ± 0.53 J	0.89 ± 0.38 J	0.228 ± 0.248 J	2.73 ± 0.9	0.41 ± 0.5 U	1.44 ± 0.518	-0.03 ± 0.59 U	0.41 ± 0.38 U	0.29 ± 0.51 U
Sulfate	N	mg/L	400	127	177	167	151	189	201	233	220	200	227	243	247	208	221	237
CALC																		
Radium-226/228	N	pCi/L	5									0.497 ± 0.308	2.93 ± 0.98	0.6 ± 0.59 U	1.47 ± 0.568	0.11 ± 0.67 U	0.73 ± 0.49 U	0.38 ± 0.56 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									30.5	15.1	5.56	6.67	9.06	8.99	1.26
GEN CHEM																		
Chloride	N	mg/L	200	31	28	27	27	26	27	26	25	24	25	24	24	23	20	22
Dissolved Solids, Total	N	mg/L	1200	500	546	574	528	566	588	598	666	600	630 H	605	638	615	565	635
pH, Lab	N	pH units	6.22-9.0[2]	7.16	7.06	7.18	7.23	7.09	7.13	7.09	7.02	7.24	7.38	7.04	7.12	7.05 H	7.21 H	7.12 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0009 J	0.001 U	0.001 U	0.0013	0.001	0.001 U	0.0019
Arsenic	T	mg/L	0.01	0.0017	0.0016	0.0018	0.002	0.0013	0.0012	0.0011	0.0011	0.0009 J	0.0012	0.001	0.0011	0.001 U	0.0012	0.0016
Barium	D	mg/L	2									0.233	0.146	0.19 B	0.219	0.21	0.216	0.269
Barium	T	mg/L	2	0.222	0.237	0.205	0.226	0.214	0.213	0.224	0.205	0.25	0.221	0.19	0.202	0.224	0.206	0.305
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									4.92	5.96	6.88	7.12	5.83	6.65	8.41
Boron	T	mg/L	2	4.65	5.93	5.83	5.64 S	5.8	6.93 S	7.42	6.66	4.77	6.61	6.31	6.84 S	5.84	5.79	9.19
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									124	93.7	98	94.1	100	107	88.8
Calcium	T	mg/L	103.2[3]	101	97.2	87.5	96.8 S	99.5	98.1	98.7	97.4	115	105	103	97.1 S	109 B	92.7	90
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0027	0.0173	0.0028	0.001 U	0.001 U	0.0048	0.0012	0.001 U	0.0028	0.0015 U	0.0022	0.0015 U	0.0019	0.0067	0.0015 U
Cobalt	D	mg/L	0.006									0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Iron	T	mg/L	NS									9.35						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0028	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0355	0.0384	0.0386	0.0406	0.0411	0.0487	0.0498
Lithium	T	mg/L	0.04	0.0335	0.0413	0.04	0.0415	0.042	0.0458	0.0451	0.0417	0.0363	0.041	0.0393	0.0406	0.0412	0.0369	0.0564
Manganese	T	mg/L	NS									0.53						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.229	0.235	0.24	0.244	0.232	0.234	0.309
Molybdenum	T	mg/L	0.1	0.249	0.287	0.272	0.243	0.274	0.314	0.324	0.323	0.237	0.271	0.259	0.265	0.235	0.225	0.207
Nickel	D	mg/L	NS									0.0015		0.001 U				
Nickel	T	mg/L	NS	0.0021	0.009	0.0021	0.0012	0.001 U	0.0031	0.0016	0.0012	0.0027		0.0023				
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-7-20170907	APW-7-20170928	APW-7-20171019	APW-7-20171109	APW-7-20171128	APW-7-20171227	APW-7-20180118	APW-7-20180208	APW-07-WG-20220616	APW-07-WG-20220914	APW-07-WG-20221130	APW-07-WG-20230130	APW-07-WG-20230626	APW-07-WG-20230919	APW-07-WG-20231128
			Location ID	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07
			Sample Date	09/07/2017	09/28/2017	10/19/2017	11/09/2017	11/28/2017	12/27/2017	01/18/2018	02/08/2018	06/16/2022	09/14/2022	11/30/2022	01/30/2023	06/26/2023	09/19/2023	11/28/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	Total or Dissolved	Units	35 IAC 845.600															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.35	0.21	0.19	0.2	0.2	0.19	0.2	0.18	0.18	0.17	0.18	0.19	0.17	0.18	0.2
Radium-226	N	pCi/L	NS	0.47 ± 0.15 U	0 ± 0.06 U	0.505 ± 0.396	0.11 ± 0.08 U	0.16 ± 0.14 U	0.25 ± 0.1 U	0.14 ± 0.09 U	0.24 ± 0.14 U	0.333 ± 0.208	0.18 ± 0.09 U	0.2 ± 0.11 U	0.337 ± 0.265	-0.01 ± 0.06 U	0.11 ± 0.07 U	0.16 ± 0.06 U
Radium-228	N	pCi/L	NS	-0.42 ± 0.79 U	0.76 ± 0.61 J	0.785 ± 0.412	1.13 ± 0.39	0.61 ± 0.51 U	0.14 ± 0.35 U	1.19 ± 0.55	0.53 ± 0.4 U	0.766 ± 0.234	1.45 ± 0.72	1.13 ± 0.66	1.77 ± 0.352	1.11 ± 0.74	0.99 ± 0.62 JQDR	0.45 ± 0.57 U
Sulfate	N	mg/L	400	66	59	52	50	61	63	67	64	72	78	48	48	54	44	40
CALC																		
Radium-226/228	N	pCi/L	5									1.1 ± 0.313	1.63 ± 0.81 U	1.33 ± 0.77 U	2.1 ± 0.441	1.11 ± 0.8 U	1.1 ± 0.69 U	0.61 ± 0.63 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									66.2	34.8	10.5	79.2	14.8	42.9	21
GEN CHEM																		
Chloride	N	mg/L	200	15	15	14	15	16	15	15	15	11	12	12	14	10	9	11
Dissolved Solids, Total	N	mg/L	1200	762	786	624	730	742	736	720	740	780	815 H	800	824	665	740	790
pH, Lab	N	pH units	6.22-9.0[2]	6.84	6.84	6.86	6.87	6.83	6.96	6.97	6.88	6.88	7.02	6.78	7.23	6.79 H	6.94 H	6.86 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.0015	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0001	0.001 U	0.001 U	0.001 U	0.0012	0.0013	0.0016
Arsenic	T	mg/L	0.01	0.0014	0.0012	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0023	0.0016	0.0011	0.0014	0.0014	0.0018	0.0022
Barium	D	mg/L	2									0.334	0.255	0.354 B	0.411	0.303	0.336	0.465
Barium	T	mg/L	2	0.465	0.448	0.394	0.401	0.37	0.374	0.38	0.359	0.374	0.382	0.381	0.371	0.312	0.303	0.522
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									0.148	0.193	0.199	0.267	0.208	0.192	0.243
Boron	T	mg/L	2	0.235	0.308	0.302	0.3	0.278	0.342	0.298	0.318	0.168	0.208	0.217	0.246	0.237	0.181	0.274
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									222	199	204	199	180 S	196	162
Calcium	T	mg/L	103.2[3]	192	204	171	187	196	193	191	185	238	210	209	200	183 BS	161	177
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0017	0.0063	0.0026	0.001 U	0.001 U	0.0329	0.001 U	0.001 U	0.0041	0.0021	0.0015 U	0.0034	0.0015 U	0.0057	0.0024
Cobalt	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013
Iron	T	mg/L	NS									17.3						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0074	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0126	0.0148	0.0158	0.0191	0.0136	0.0184	0.0212
Lithium	T	mg/L	0.04	0.0147	0.0181	0.0172	0.0176	0.0185	0.0191	0.0181	0.0178	0.0143	0.0161	0.0166	0.0181	0.0153	0.0141	0.0231
Manganese	T	mg/L	NS									1.11						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0026	0.0026	0.0021	0.0027	0.0027	0.0029	0.004
Molybdenum	T	mg/L	0.1	0.0046	0.0036	0.0033	0.0023	0.003	0.0044	0.0037	0.0036	0.0035	0.003	0.0029	0.0031	0.0028	0.0029	0.0042
Nickel	D	mg/L	NS									0.0008 J		0.001 U				
Nickel	T	mg/L	NS	0.0014	0.0033	0.0013	0.001 U	0.001 U	0.015	0.001 U	0.001 U	0.0042		0.001 U				
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-8-20170907	APW-8-20170928	APW-8-20171018	APW-8-20171108	APW-8-20171127	APW-8-20171227	APW-8-20180117	APW-8-20180208	APW-08-WG-20220616	APW-08-WG-20220915	APW-08-WG-20221130	APW-08-WG-20230202	APW-08-WG-20230626	APW-08-WG-20230919	APW-08-WG-20231128
			Location ID	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08
			Sample Date	09/07/2017	09/28/2017	10/18/2017	11/08/2017	11/27/2017	12/27/2017	01/17/2018	02/08/2018	06/16/2022	09/15/2022	11/30/2022	02/02/2023	06/26/2023	09/19/2023	11/28/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.3	0.3	0.29	0.29	0.28	0.28	0.3	0.28	0.29	0.26	0.28	0.26	0.26	0.26	0.29
Radium-226	N	pCi/L	NS	0.22 ± 0.12 U	0.12 ± 0.08 U	0.2 ± 0.393	0.11 ± 0.1 U	0.35 ± 0.16 U	0.14 ± 0.08 U	0.21 ± 0.11 U	0.39 ± 0.15 U	0.208 ± 0.236 J	0.27 ± 0.1 U	0.4 ± 0.13 U	0.247 ± 0.244 J	0.34 ± 0.12 U	0.23 ± 0.09 U	0.1 ± 0.05 U
Radium-228	N	pCi/L	NS	1.13 ± 0.63	0.88 ± 0.48 J	1.3 ± 0.545	0.37 ± 0.25 U	0.77 ± 0.55 J	1.31 ± 0.58	0.64 ± 0.49 U	0.49 ± 0.43 U	0.526 ± 0.224	0.86 ± 0.62 J	1.68 ± 0.77	-0.157 ± 0.282 U	0.11 ± 0.6 U	0.81 ± 0.49 JQDR	0.15 ± 0.54 U
Sulfate	N	mg/L	400	43	40	38	40	39	38	39	37	39	39	34	29	31	23	24
CALC																		
Radium-226/228	N	pCi/L	5									0.735 ± 0.325	1.13 ± 0.72 U	2.08 ± 0.9	0.247 ± 0.373 J	0.45 ± 0.72 U	1.04 ± 0.58 U	0.25 ± 0.59 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									119	139	305	26.9	152	141	169
GEN CHEM																		
Chloride	N	mg/L	200	9	10	10	10	10	11	12	11	9	11	12	13	10	10	11
Dissolved Solids, Total	N	mg/L	1200	438	458	436	446	466	410	398	442	382	372 H	370	378	420	440	395
pH, Lab	N	pH units	6.22-9.0[2]	7.04	7.07	7	7.12	7.25	7.11	7.04	7.04	7.34	7.47	7.25	7.31	7.18 H	7.16 H	7.27 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0011	0.001 U	0.0012	0.001	0.001	0.0014	0.0019
Arsenic	T	mg/L	0.01	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.0022	0.0015	0.0017	0.0016	0.002	0.0018	0.0025
Barium	D	mg/L	2									0.194	0.163	0.146 B	0.15	0.191	0.236	0.255
Barium	T	mg/L	2	0.207	0.256	0.219	0.24	0.217	0.223	0.226	0.215	0.235	0.19	0.179	0.167	0.225	0.199	0.261
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									0.0777	0.0993	0.0844	0.0895	0.124	0.117	0.154
Boron	T	mg/L	2	0.132	0.154	0.135	0.138	0.141	0.145	0.151	0.132	0.115	0.11	0.103	0.095	0.103	0.116	0.155
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									108	79.7	75.4	72.1	92.6	94.1 S	71.3
Calcium	T	mg/L	103.2[3]	97.4	105	92.6	101	102	98.6	95	97.8	93.3	85.1	82.8	79.4	99.4 B	86.4	81.2
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0018	0.0023	0.001 U	0.0059	0.001 U	0.0021	0.001 U	0.001 U	0.0054	0.0016	0.0036	0.0027	0.0062	0.0031	0.0049
Cobalt	D	mg/L	0.006									0.0013	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.0017	0.0013	0.001	0.0012	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.0013	0.0016	0.0012	0.0019	0.0014	0.0021
Iron	T	mg/L	NS									3.14						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0024	0.001 U	0.0012	0.001 U	0.0028	0.0015	0.0018
Lithium	D	mg/L	0.04									0.0141	0.0142	0.0132	0.0131	0.0125	0.022	0.0204
Lithium	T	mg/L	0.04	0.0196	0.0206	0.0207	0.0216	0.0223	0.0216	0.0192	0.0196	0.016	0.016	0.0147	0.0155	0.0157	0.0177	0.0211
Manganese	T	mg/L	NS									0.202						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0008 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Molybdenum	T	mg/L	0.1	0.0011	0.001 U	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Nickel	D	mg/L	NS									0.0023		0.0012				
Nickel	T	mg/L	NS	0.0039	0.0043	0.0029	0.0062	0.0026	0.0027	0.0026	0.0026	0.0054		0.0027				
Selenium	D	mg/L	0.05									0.0027	0.0068	0.0126	0.0128	0.0113	0.0121	0.0231
Selenium	T	mg/L	0.05	0.008	0.0141	0.0132	0.0149	0.0135	0.0141	0.0149	0.013	0.0036	0.0077	0.011	0.0148	0.0129	0.0122	0.0221
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling								
			Sample ID	APW-9-20170907	APW-9-20170927	APW-9-20171018	APW-9-20171108	APW-9-20171127	APW-9-20171228	APW-9-20180117	APW-9-20180208	APW-09-WG-20220615	APW-09-WG-20220913	APW-09-WG-20221130	APW-09-WG-20230201	APW-09-WG-20230627	APW-09-WG-20230920	DUP-02-WG-20230920	APW-09-WG-20231129	DUP-02-WG-20231129
			Location ID	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09	APW-09
			Sample Date	09/05/2017	09/27/2017	10/18/2017	11/08/2017	11/27/2017	12/28/2017	01/17/2018	02/08/2018	06/15/2022	09/13/2022	11/30/2022	02/01/2023	06/27/2023	09/20/2023	09/20/2023	11/29/2023	11/29/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**																	
UNSPECIFIED																				
Fluoride	N	mg/L	4	0.19	0.22	0.21	0.2	0.2	0.2	0.22	0.19	0.23	0.19	0.2	0.19	0.19	0.2	0.19	0.2	0.21
Radium-226	N	pCi/L	NS	0.17 ± 12 U	0.03 ± 0.07 U	-0.229 ± 0.389	0.14 ± 0.09 U	-0.06 ± 0.1 U	0.14 ± 0.08 U	0.05 ± 0.08 U	0.13 ± 0.13 U	0.267 ± 0.199	0.24 ± 0.09 U	0.06 ± 0.06 U	0.0975 ± 0.156 J	0.18 ± 0.09 U	0 ± 0.05 U	-0.02 ± 0.05 U	0 ± 0.02 U	0.03 ± 0.03 U
Radium-228	N	pCi/L	NS	0.91 ± .69 J	0.67 ± 0.56 U	0.275 ± 0.316	0.49 ± 0.29 U	1.07 ± 0.48 U	1.06 ± 0.51	0.46 ± 0.46 U	0.23 ± 0.37 U	-0.213 ± 0.244 U	0.22 ± 0.49 U	0.77 ± 0.55 J	0.023 ± 0.243 U	0.35 ± 0.65 U	1.17 ± 0.6	0.22 ± 0.41 U	0.8 ± 0.65 J	0.2 ± 0.66 U
Sulfate	N	mg/L	400	65	47	53	65	50	42	28	25	104	39	36	38	47	32	31	34	35
CALC																				
Radium-226/228	N	pCi/L	5									0.267 ± 0.315 J	0.46 ± 0.58 U	0.83 ± 0.61 U	0.12 ± 0.289 U	0.53 ± 0.74 U	1.17 ± 0.65 U	0.22 ± 0.46 U	0.8 ± 0.67 U	0.23 ± 0.69 U
FIELD PARAM																				
Turbidity, Field	N	NTU	17.96[1]									34.2	7.3	7.28	23.6	24.7	5.64		3.82	
GEN CHEM																				
Chloride	N	mg/L	200	13	13	13	13	13	13	13	768	13	12	12	13	12	11	11	12	12
Dissolved Solids, Total	N	mg/L	1200	364 R	372	324	366	392	278	348	3380	424	380 H	372	360	386	372	386	380	376
pH, Lab	N	pH units	6.22-9.0[2]	7.31	7.35	7.39	7.39	7.52	7.42	7.57	7.33	7.48	7.59	7.32	7.72	7.32 H	7.56 H	7.65 H	7.5 H	7.45 H
METALS																				
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0019	0.0021	0.0019	0.0019	0.0021	0.0022	0.0021	0.002	0.002
Arsenic	T	mg/L	0.01	0.0031	0.0024	0.0018	0.0022	0.002	0.002	0.0022	0.0022	0.0026	0.0025	0.0021	0.0024	0.0021	0.002	0.0023	0.0026	0.0028
Barium	D	mg/L	2									0.129	0.111	0.109 B	0.107	0.116	0.114	0.117	0.109	0.108
Barium	T	mg/L	2	0.227	0.171	0.118	0.133	0.121	0.129	0.133	0.125	0.186	0.134	0.124	0.122	0.123	0.12	0.125	0.131	0.143
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									1.32	0.327	0.24	0.239	0.572	0.234	0.236	0.169	0.166
Boron	T	mg/L	2	0.877	0.569	0.668	0.792	0.506	0.369	0.317	0.255	1.61	0.329	0.243	0.225	0.473	0.209	0.239	0.191	0.221
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[1]									107 S	76.5	78.3	76.3	82.8 S	81	81.1	73.5	73.6
Calcium	T	mg/L	103.2[1]	85.9	85.3	76.5	81.9	85.6	81.5 S	80.3	92	110	89.5	80.5	80.3	86.9 B	69.5	87.5	80.9	111
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0148	0.0021	0.001 U	0.001 U	0.001 U	0.0011	0.0016	0.001 U	0.0011 J	0.0015 U	0.0015	0.0015 U	0.0015 U	0.0018	0.0015 U	0.0015 U	0.0015 U
Cobalt	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.0031	0.0014	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Iron	T	mg/L	NS									0.496								
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0039	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0184	0.0137	0.0131	0.0125	0.0163	0.0196	0.0184	0.0121	0.012
Lithium	T	mg/L	0.04	0.0176	0.0173	0.0174	0.018	0.0167	0.0173	0.0155	0.0148	0.0246	0.0143	0.0131	0.0137	0.0157	0.0134	0.015	0.0138	0.0163
Manganese	T	mg/L	NS									0.599								
Mercury	D	mg/L	0.002										0.0002 U							
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0351	0.0182	0.0139	0.0165	0.0211	0.0167	0.0173	0.0154	0.0146
Molybdenum	T	mg/L	0.1	0.0223	0.0252	0.0327	0.0303	0.0247	0.0246	0.0223	0.0224	0.0455	0.0194	0.015	0.0173	0.0189	0.0162	0.0173	0.0188	0.0171
Nickel	D	mg/L	NS									0.0017		0.001 U						
Nickel	T	mg/L	NS	0.012	0.0032	0.001 U	0.001	0.001 U	0.001 U	0.0012	0.001 U	0.004		0.0019						
Selenium	D	mg/L	0.05									0.021	0.0142	0.0147	0.0179	0.0186	0.0155	0.0162	0.0163	0.0159
Selenium	T	mg/L	0.05	0.0126	0.0139	0.017	0.0186	0.0138	0.0143	0.0147	0.0134	0.0219	0.0151	0.0138	0.0196	0.0198	0.0153	0.0182	0.0214	0.0194
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephalometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
			Sample ID	APW-10D-20170907	APW-10D-20170927	APW-10D-20171019	APW-10D-20171109	APW-10D-20171128	APW-10D-20171228	APW-10D-20180118	APW-10D-20180209	APW-10D-WG-20220615	APW-10D-WG-20220916	APW-10D-WG-20221129	APW-10D-WG-20230202	APW-10D-WG-20230626	APW-10D-WG-20230919	APW-10D-WG-20231127
			Location ID	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D
			Sample Date	09/07/2017	09/27/2017	10/19/2017	11/09/2017	11/28/2017	12/28/2017	01/18/2018	02/09/2018	06/15/2022	09/16/2022	11/29/2022	02/02/2023	06/26/2023	09/19/2023	11/27/2023
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.1	0.12	0.1	0.1 U	0.11	0.1	0.11	0.1 U	0.12	0.1	0.12	0.12	0.11	0.11	0.14
Radium-226	N	pCi/L	NS	0.34 ± 0.12 U	-0.11 ± 0.1 U	0.121 ± 0.337	0.19 ± 0.12 U	0.16 ± 0.13 U	0.23 ± 0.1 U	0.08 ± 0.1 U	0 ± 0.07 U	0.249 ± 0.207	0.22 ± 0.09 U	0.31 ± 0.11 U	0.186 ± 0.157	0.31 ± 0.12 U	0.21 ± 0.09 U	0.14 ± 0.06 U
Radium-228	N	pCi/L	NS	1.16 ± 0.52	1.72 ± 0.64	0.633 ± 0.366	0.98 ± 0.33 J	0.47 ± 0.55 U	0.34 ± 0.37 U	0.98 ± 0.6 J	0.59 ± 0.43 U	1.19 ± 0.311	0.56 ± 0.58 U	0.28 ± 0.43 U	0.847 ± 0.370	1.39 ± 0.76	0.61 ± 0.49 U	1.36 ± 0.77
Sulfate	N	mg/L	400	38	44	43	42	42	44	44	44	41	43	42	39	44	31	26
CALC																		
Radium-226/228	N	pCi/L	5									1.44 ± 0.374	0.78 ± 0.67 U	0.59 ± 0.54 U	1.03 ± 0.402	1.7 ± 0.88 U	0.82 ± 0.58 U	1.5 ± 0.83 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									46.9	21.9	36.4	45.3	176	169	196
GEN CHEM																		
Chloride	N	mg/L	200	24	17	17	15	17	16	14	16	16	18	14	13	14	10	10
Dissolved Solids, Total	N	mg/L	1200	466	474	442	468	482	448	448	512	452	460 H	460	454	485	468	445
pH, Lab	N	pH units	6.22-9.0[2]	7.12	7.11	7.05	7.11	7.12	7.15	7.03	7.03	7.21	7.29	7.04	7.57	6.98 H	7.22 H	7.08 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.0008 J	0.001 U	0.0012	0.0011	0.0011	0.0011	0.0018
Arsenic	T	mg/L	0.01	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.0017	0.0057	0.0014	0.0017	0.0019	0.0016	0.0021
Barium	D	mg/L	2									0.342	0.321	0.3 B	0.304	0.348	0.355	0.448
Barium	T	mg/L	2	0.437	0.304	0.363	0.325	0.284	0.295	0.391	0.357	0.407	0.418	0.276	0.343	0.485	0.339	0.398
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									0.0786	0.0711	0.0841	0.0579	0.0704	0.0639	0.0823
Boron	T	mg/L	2	0.0999	0.101	0.0843	0.0713	0.0885	0.0922	0.0923	0.0906	0.118	0.0731	0.0522	0.073	0.0674	0.066	0.0754
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									143	124	113	114	114	116	83.4
Calcium	T	mg/L	103.2[3]	118	136	120	121	125	123	148 S	124 S	135	374	115	122	611 B	118	120
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0036	0.0078	0.0022	0.0011	0.001 U	0.001 U	0.0042	0.001 U	0.0015 U	0.0148	0.0024	0.0015 U	0.0015	0.0042	0.0021
Cobalt	D	mg/L	0.006									0.0025	0.0021	0.0032	0.003	0.0026	0.0026	0.0038
Cobalt	T	mg/L	0.006	0.0039	0.0024	0.0025	0.0032	0.0017	0.0013	0.0026	0.0026	0.0034	0.0049	0.003	0.0033	0.007	0.0031	0.0039
Iron	T	mg/L	NS									0.758						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0135	0.0135	0.0133	0.012	0.0148	0.02	0.0176
Lithium	T	mg/L	0.04	0.0147	0.0155	0.0146	0.0146	0.0153	0.0155	0.0142	0.014	0.018	0.0156	0.0126	0.0146	0.0158	0.0148	0.0154
Manganese	T	mg/L	NS									1.16						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0025
Molybdenum	T	mg/L	0.1	0.0024	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Nickel	D	mg/L	NS									0.0054		0.0054				
Nickel	T	mg/L	NS	0.0095	0.0077	0.0065	0.0057	0.0035	0.0025	0.0072	0.0053	0.007		0.0063				
Selenium	D	mg/L	0.05									0.001 U	0.0016	0.0015	0.0024	0.0013	0.0016	0.0043
Selenium	T	mg/L	0.05	0.001 U	0.0011	0.0012	0.0013	0.001 U	0.0014	0.0016	0.0016	0.001 U	0.0021	0.0013	0.0027	0.0016	0.0013	0.0033
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
H = Holding times exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range for precision
S = Spike Recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limit

*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
2 Standard value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Highlighted values exceed action level
NS = No standard

Table 1
Groundwater Summary Table
Grand Tower Energy Center (GTEC)
Grand Tower, US-IL

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
Sample ID				**APW-10S-20170907**	**APW-10S-20170927**	**APW-10S-20171019**	**APW-10S-20171109**	**APW-10S-20171128**	**APW-10S-20171228**	**APW-10S-20180118**	**APW-10S-20180209**	**APW-10S-WG-20220615**	**APW-10S-WG-20220915**	**APW-10S-WG-20221129**	**APW-10S-WG-20230202**	**APW-10S-WG-20230626**	**APW-10S-WG-20230919**	**APW-10S-WG-20231127**
Location ID				**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**	**APW-10S**
Sample Date				**09/07/2017**	**09/27/2017**	**10/19/2017**	**11/09/2017**	**11/28/2017**	**12/28/2017**	**01/18/2018**	**02/09/2018**	**06/15/2022**	**09/15/2022**	**11/29/2022**	**02/02/2023**	**06/26/2023**	**09/19/2023**	**11/27/2023**
Sample Type				**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Parameter/Analyte	**Total or Dissolved**	**Units**	**35 IAC 845.600**															
UNSPECIFIED																		
Fluoride	N	mg/L	4	0.19	0.21	0.16	0.16	0.16	0.17	0.17	0.16	0.17	0.15	0.17	0.15	0.15	0.16	0.18
Radium-226	N	pCi/L	NS	0.4 ± 0.14 U	0.19 ± 0.11 U	0.774 ± 0.430	0.16 ± 0.11 U	0.18 ± 0.16 U	0.23 ± 0.1 U	0.29 ± 0.12 U	0.24 ± 0.13 U	0.778 ± 0.324	0.3 ± 0.1 U	0.31 ± 0.11 U	1.08 ± 0.395	0.37 ± 0.13 U	0.59 ± 0.14 U	0.32 ± 0.09 U
Radium-228	N	pCi/L	NS	0.38 ± 0.47 U	0.98 ± 0.7 J	0.856 ± 0.391	0.71 ± 0.33 J	0.66 ± 0.57 U	0.56 ± 0.43 U	2.71 ± 0.78	0.93 ± 0.52 J	0.475 ± 0.268 J	2.52 ± 0.91	1.64 ± 0.68	0.162 ± 0.371 U	-0.18 ± 0.47 U	4.24 ± 0.91	0.95 ± 0.66 J
Sulfate	N	mg/L	400	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	21 S	10 U	10 U	10 U	10 SU	10 U
CALC																		
Radium-226/228	N	pCi/L	5									1.25 ± 0.42	2.82 ± 1.01	1.95 ± 0.79 U	1.24 ± 0.542	0.37 ± 0.6 U	4.83 ± 1.05	1.27 ± 0.75 U
FIELD PARAM																		
Turbidity, Field	N	NTU	17.96[1]									61.5	34.3	52.6	37.3	57.2	63.6	13.1
GEN CHEM																		
Chloride	N	mg/L	200	10	7	6	6	6	6	6	6	12	15	18	21	14	15	20
Dissolved Solids, Total	N	mg/L	1200	708	720	678	708	734	770	680 R	762	735	770 H	750	780	725	775	900
pH, Lab	N	pH units	6.22-9.0[2]	6.99	6.96	6.95	6.98	6.97	6.98	7.06	6.91	7.09	7.2	6.95	7.2	7.01 H	7.17 H	7.01 H
METALS																		
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.0016	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.152	0.0612	0.0138	0.171	0.166	0.176	0.251
Arsenic	T	mg/L	0.01	0.186	0.189	0.18	0.209	0.183	0.193	0.23	0.198	0.185	0.187	0.182	0.191	0.194	0.174	0.276
Barium	D	mg/L	2									0.423	0.292	0.162 B	0.506	0.506	0.567	0.711
Barium	T	mg/L	2	0.613	0.634	0.543	0.668	0.565	0.598	0.703	0.585	0.575	0.612	0.536	0.575	0.589	0.591	0.804
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									0.57	0.541	7.48	0.497	0.578	0.571	0.682
Boron	T	mg/L	2	0.525	0.544	0.536	0.595	0.545	0.573	0.645	0.582	0.683	0.565	0.569	0.592	0.582	0.553	0.555
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2[3]									169	156	142	145	142	151	137
Calcium	T	mg/L	103.2[3]	136	144	135	152	150	145	140	140	161	171 S	154	145	153 B	134	129 S
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0091	0.0019	0.001	0.0016	0.001 U	0.0016	0.0019	0.001 U	0.0015 J	0.015	0.0032	0.0023	0.0025	0.0087	0.0016
Cobalt	D	mg/L	0.006									0.0001 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0006 J	0.0021	0.0013	0.001 U	0.001 U	0.0021	0.0013
Iron	T	mg/L	NS									19.6						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0007 J	0.0043	0.0014	0.001 U	0.0016	0.0031	0.001 U
Lithium	D	mg/L	0.04									0.0266	0.0286	0.0387 R	0.0268	0.0278	0.0349	0.0359
Lithium	T	mg/L	0.04	0.0263	0.0278	0.0272	0.0289	0.0293	0.0308	0.0316	0.0297	0.0353	0.033	0.0307	0.0323	0.0291	0.0301	0.0401
Manganese	T	mg/L	NS									0.243						
Mercury	D	mg/L	0.002										0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Molybdenum	T	mg/L	0.1	0.0017	0.0016	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0021
Nickel	D	mg/L	NS									0.001 U		0.001 U				
Nickel	T	mg/L	NS	0.0051	0.0012	0.001 U	0.0015	0.001 U	0.001 U	0.0014	0.001 U	0.0014		0.0031				
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:
Empty cells = not analyzed
N = Normal Environmental Sample
FD = Field Duplicate Sample
NA = not applicable
T = total
D = dissolved
mg/L = milligrams per liter
pCi/L = picocuries per liter
NTU = nephelometric turbidity units
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*Protection Standard is from Title 35 Section 845.600 unless otherwise noted
1 Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
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Highlighted values exceed action level
NS = No standard

APPENDIX A 2023 MONITORING WELL INSPECTION FORMS

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R		Date:	1/30/2023
Total Depth (Actual):	58.38	(BTOC)	Time:	12:15
Total Depth (Measured):	58.23	(BTOC)		
Depth to Water (Measured):	33.8	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02		Date:	1/30/2023
Total Depth (Actual):	58.75	(BTOC)	Time:	10:15
Total Depth (Measured):	58.55	(BTOC)		
Depth to Water (Measured):	33.19	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	NO
Water present in protector:	YES
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03		Date:	1/30/2023
Total Depth (Actual):	59.65	(BTOC)	Time:	11:45
Total Depth (Measured):	59.42	(BTOC)		
Depth to Water (Measured):	32.95	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	NO
Water present in protector:	YES
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04		Date:	1/30/2023
Total Depth (Actual):	60.4	(BTOC)	Time:	12:00
Total Depth (Measured):	60.35	(BTOC)		
Depth to Water (Measured):	34.75	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05		Date:	1/30/2023
Total Depth (Actual):	56.9	(BTOC)	Time:	10:00
Total Depth (Measured):	57.5	(BTOC)		
Depth to Water (Measured):	31.33	(BTOC)		

Is well screen occluded more than 10%? YES

If Yes, list steps for redevelopment: NA

LNAPL Present: NO

If Yes, measured thickness =

DNAPL Present: NO

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT YES

Well ID present and readable: YES

Locks intact: YES

Weep hole present: YES

Water present in protector: NO

Are well "markers" (i.e.bumper posts) needed at this location: NO

If yes, are current well "markers" adequate around well:

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: NO

Any observed ponding: NO

Is surface run-off flow evident around well: NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: YES

Well cap in place: YES

Comments:

General Comments:

Well screen occluded by more than 40%. APW-05 is scheduled for abandonment and redrilling scheduled before Q2 2023.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S		Date:	1/30/2023
Total Depth (Actual):	63.98	(BTOC)	Time:	9:45
Total Depth (Measured):	64.43	(BTOC)		
Depth to Water (Measured):	30.78	(BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present: NO

If Yes, measured thickness =

DNAPL Present: NO

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT YES

Well ID present and readable: YES

Locks intact: YES

Weep hole present: YES

Water present in protector: NO

Are well "markers" (i.e.bumper posts) needed at this location: NO

If yes, are current well "markers" adequate around well:

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: NO

Any observed ponding: NO

Is surface run-off flow evident around well: NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: YES

Well cap in place: YES

Comments:

General Comments:

Sand surrounding the well and marking points.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D		Date:	1/30/2023
Total Depth (Actual):	152.57	(BTOC)	Time:	9:30
Total Depth (Measured):	156.71	(BTOC)		
Depth to Water (Measured):	30.86	(BTOC)		

Is well screen occluded more than 10%?	9:30
If Yes, list steps for redevelopment:	
LNAPL Present:	
If Yes, measured thickness =	
DNAPL Present:	
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	NO
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	YES
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Sand surrounding the well and marking points.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07		Date:	1/30/2023
Total Depth (Actual):	63.35	(BTOC)	Time:	11:30
Total Depth (Measured):	63.18	(BTOC)		
Depth to Water (Measured):	28.02	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08		Date:	1/30/2023
Total Depth (Actual):	61.89	(BTOC)	Time:	11:15
Total Depth (Measured):	61.75	(BTOC)		
Depth to Water (Measured):	29.95	(BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present: NO

If Yes, measured thickness =

DNAPL Present: NO

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT YES

Well ID present and readable: YES

Locks intact: YES

Weep hole present: YES

Water present in protector: NO

Are well "markers" (i.e.bumper posts) needed at this location: NO

If yes, are current well "markers" adequate around well:

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: NO

Any observed ponding: NO

Is surface run-off flow evident around well: NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: YES

Well cap in place: YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09		Date:	1/30/2023
Total Depth (Actual):	63.4	(BTOC)	Time:	10:30
Total Depth (Measured):	63.18	(BTOC)		
Depth to Water (Measured):	34.09	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S		Date:	1/30/2023
Total Depth (Actual):	62.84	(BTOC)	Time:	10:45
Total Depth (Measured):	62.78	(BTOC)		
Depth to Water (Measured):	27.08	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	NO
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D		Date:	1/30/2023
Total Depth (Actual):	98.19	(BTOC)	Time:	11:00
Total Depth (Measured):	98.15	(BTOC)		
Depth to Water (Measured):	26.72	(BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present: NO

If Yes, measured thickness =

DNAPL Present: NO

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT YES

Well ID present and readable: YES

Locks intact: YES

Weep hole present: YES

Water present in protector: NO

Are well "markers" (i.e.bumper posts) needed at this location: NO

If yes, are current well "markers" adequate around well:

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: NO

Any observed ponding: NO

Is surface run-off flow evident around well: NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: YES

Well cap in place: YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R		Date:	6/26/2023
Total Depth (Actual):	62.98	(BTOC)	Time:	10:05
Total Depth (Measured):	62.89	(BTOC)		
Depth to Water (Measured):	32.63	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	YES
If yes, are current well "markers" adequate around well:	
Comments:	No well markers present.

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

APW-05 was redrilled as APW-05R following the Q1 2023 groundwater sampling event.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R		Date:	6/26/2023
Total Depth (Actual):	58.38	(BTOC)	Time:	10:25
Total Depth (Measured):	56.22	(BTOC)		
Depth to Water (Measured):	32.92	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	YES
Well cap in place:	YES
Comments:	

General Comments:

Hole in the ground around ballards.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02		Date:	6/26/2023
Total Depth (Actual):	58.75	(BTOC)	Time:	10:10
Total Depth (Measured):	58.43	(BTOC)		
Depth to Water (Measured):	32.24	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	YES
Well cap in place:	YES
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03		Date:	6/26/2023
Total Depth (Actual):	59.65	(BTOC)	Time:	11:05
Total Depth (Measured):	59.42	(BTOC)		
Depth to Water (Measured):	32.01	(BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present: NO

If Yes, measured thickness =

DNAPL Present: NO

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT YES

Well ID present and readable: YES

Locks intact: YES

Weep hole present: YES

Water present in protector: YES

Are well "markers" (i.e.bumper posts) needed at this location: NO

If yes, are current well "markers" adequate around well:

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: YES

Any observed ponding: NO

Is surface run-off flow evident around well: NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: YES

Well cap in place: YES

Comments:

General Comments:

Water present in protector.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04		Date:	6/26/2023
Total Depth (Actual):	60.4	(BTOC)	Time:	10:35
Total Depth (Measured):	60.28	(BTOC)		
Depth to Water (Measured):	33.55	(BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present: NO

If Yes, measured thickness =

DNAPL Present: NO

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT YES

Well ID present and readable: YES

Locks intact: YES

Weep hole present: YES

Water present in protector: NO

Are well "markers" (i.e.bumper posts) needed at this location: YES

If yes, are current well "markers" adequate around well: NO

Comments: Only 2 well markers - both in bad condition.

Well Surface Seal: INTACT

Is surrounding area sloped away from well: YES

Any observed ponding: NO

Is surface run-off flow evident around well: NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: YES

Well cap in place: YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S		Date:	6/26/2023
Total Depth (Actual):	63.98	(BTOC)	Time:	10:00
Total Depth (Measured):	63.83	(BTOC)		
Depth to Water (Measured):	31.09	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Sand surrounding the well and marking points.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D		Date:	6/27/2023
Total Depth (Actual):	152.57	(BTOC)	Time:	9:45
Total Depth (Measured):	156.62	(BTOC)		
Depth to Water (Measured):	30.77	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	YES
Well cap in place:	YES
Comments:	

General Comments:

Sand surrounding the well and marking points. Had to do well inspection on 6/27 due to wasp nst in well protector.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07		Date:	6/26/2023
Total Depth (Actual):	63.35	(BTOC)	Time:	11:00
Total Depth (Measured):	63.19	(BTOC)		
Depth to Water (Measured):	27.69	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08		Date:	6/26/2023
Total Depth (Actual):	61.89	(BTOC)	Time:	10:55
Total Depth (Measured):	61.85	(BTOC)		
Depth to Water (Measured):	28.52	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	YES
Well cap in place:	YES
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09		Date:	6/26/2023
Total Depth (Actual):	63.4	(BTOC)	Time:	10:30
Total Depth (Measured):	63.14	(BTOC)		
Depth to Water (Measured):	32.44	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S		Date:	6/26/2023
Total Depth (Actual):	62.84	(BTOC)	Time:	10:42
Total Depth (Measured):	62.75	(BTOC)		
Depth to Water (Measured):	26.75	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	YES
Well cap in place:	YES
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D		Date:	6/26/2023
Total Depth (Actual):	98.19	(BTOC)	Time:	10:40
Total Depth (Measured):	98.07	(BTOC)		
Depth to Water (Measured):	24.64	(BTOC)		

Is well screen occluded more than 10%?	NO
If Yes, list steps for redevelopment:	
LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		YES
Well cap in place:		YES
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R	Date:	9/19/2023
Total Depth (Actual):	58.38 ft (BTOC)	Time:	9:38
Total Depth (Measured):	58.21 ft (BTOC)	Collection Order:	6th
Depth to Water (Measured):	37.41 ft		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Hole in the ground around ballards.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02	Date:	9/19/2023
Total Depth (Actual):	58.75 ft (BTOC)	Time:	9:12
Total Depth (Measured):	58.40 ft (BTOC)	Collection Order:	4th
Depth to Water (Measured):	36.81 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	NO
Water present in protector:	YES
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03	Date:	9/19/2023
Total Depth (Actual):	59.65 ft (BTOC)	Time:	10:37
Total Depth (Measured):	59.42 ft (BTOC)	Collection Order:	12th
Depth to Water (Measured):	36.45 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	NO
Water present in protector:	YES
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04	Date:	9/19/2023
Total Depth (Actual):	60.40 ft (BTOC)	Time:	9:51
Total Depth (Measured):	60.25 ft (BTOC)	Collection Order:	7th
Depth to Water (Measured):	38.03 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	YES
If yes, are current well "markers" adequate around well:	NO

Comments: Only 2 well markers - both in bad condition

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R	Date:	9/19/2023
Total Depth (Actual):	62.98 ft (BTOC)	Time:	9:03
Total Depth (Measured):	62.93 ft (BTOC)	Collection Order:	3rd
Depth to Water (Measured):	36.11 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	YES
If yes, are current well "markers" adequate around well:	NO

Comments: No well markers present

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D	Date:	9/19/2023
Total Depth (Actual):	152.57 ft (BTOC)	Time:	8:49
Total Depth (Measured):	154.80 ft (BTOC)	Collection Order:	1st
Depth to Water (Measured):	34.97 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	NO
Locks intact:	YES
Weep hole present:	NO
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Sand surrounding the well and bumper posts

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S	Date:	9/19/2023
Total Depth (Actual):	63.98 ft (BTOC)	Time:	8:53
Total Depth (Measured):	63.80 ft (BTOC)	Collection Order:	2nd
Depth to Water (Measured):	35.31 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	NO
Locks intact:	YES
Weep hole present:	NO
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Sand surrounding the well and bumper posts

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07	Date:	9/19/2023
Total Depth (Actual):	63.35 ft (BTOC)	Time:	10:21
Total Depth (Measured):	63.17 ft (BTOC)	Collection Order:	10th
Depth to Water (Measured):	32.09 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08	Date:	9/19/2023
Total Depth (Actual):	61.89 ft (BTOC)	Time:	10:29
Total Depth (Measured):	61.96 ft (BTOC)	Collection Order:	11th
Depth to Water (Measured):	33.09 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09	Date:	9/19/2023
Total Depth (Actual):	63.40 ft (BTOC)	Time:	9:31
Total Depth (Measured):	63.15 ft (BTOC)	Collection Order:	5th
Depth to Water (Measured):	37.00 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D	Date:	9/19/2023
Total Depth (Actual):	98.19 ft (BTOC)	Time:	10:11
Total Depth (Measured):	98.08 ft (BTOC)	Collection Order:	9th
Depth to Water (Measured):	29.45 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S	Date:	9/19/2023
Total Depth (Actual):	62.84 ft (BTOC)	Time:	10:03
Total Depth (Measured):	62.75 ft (BTOC)	Collection Order:	8th
Depth to Water (Measured):	31.18 ft (BTOC)		

Is well screen occluded more than 10%? NO

If Yes, list steps for redevelopment:

LNAPL Present:	NO
If Yes, measured thickness =	
DNAPL Present:	NO
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	YES
Well ID present and readable:	YES
Locks intact:	YES
Weep hole present:	YES
Water present in protector:	NO
Are well "markers" (i.e.bumper posts) needed at this location:	NO
If yes, are current well "markers" adequate around well:	

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	YES
Any observed ponding:	NO
Is surface run-off flow evident around well:	NO

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	YES
Well cap in place:	YES

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02	Date:	11/27/2023
Total Depth (Actual):	58.30 (BTOC)	Time:	11:44 AM
Total Depth (Measured):	59.05 (BTOC)	Collection Order:	4
Depth to Water (Measured):	35.71 (BTOC)		

Is well screen occluded more than 10%? No
If Yes, list steps for redevelopment:

LNAPL Present: No
If Yes, measured thickness =
DNAPL Present: No
If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT Yes
Well ID present and readable: Yes
Locks intact: Yes
Weep hole present: No
Water present in protector: Yes
Are well "markers" (i.e.bumper posts) needed at this location: No
If yes, are current well "markers" adequate around well:
Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: Yes
Any observed ponding: No
Is surface run-off flow evident around well: No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches
Marking point present: Yes
Well cap in place: Yes
Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03	Date:	11/27/2023
Total Depth (Actual):	59.90 (BTOC)	Time:	1:00 PM
Total Depth (Measured):	60.15 (BTOC)	Collection Order:	12
Depth to Water (Measured):	35.80 (BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04	Date:	11/27/2023
Total Depth (Actual):	60.27 (BTOC)	Time:	12:15 PM
Total Depth (Measured):	60.45 (BTOC)	Collection Order:	7
Depth to Water (Measured):	37.25 (BTOC)		

Is well screen occluded more than 10%? No

If Yes, list steps for redevelopment:

LNAPL Present: No

If Yes, measured thickness =

DNAPL Present: No

If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT Yes

Well ID present and readable: Yes

Locks intact: Yes

Weep hole present: No

Water present in protector: No

Are well "markers" (i.e.bumper posts) needed at this location: No

If yes, are current well "markers" adequate around well:

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: No

Any observed ponding: No

Is surface run-off flow evident around well: No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present: Yes

Well cap in place: Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R	Date:	11/27/2023
Total Depth (Actual):	62.98 (BTOC)	Time:	11:40 AM
Total Depth (Measured):	63.70 (BTOC)	Collection Order:	3
Depth to Water (Measured):	34.76 (BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D	Date:	11/27/2023
Total Depth (Actual):	155.10 (BTOC)	Time:	11:30 AM
Total Depth (Measured):	156.95 (BTOC)	Collection Order:	2
Depth to Water (Measured):	33.70 (BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well protector surrounded by sand.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S	Date:	11/27/2023
Total Depth (Actual):	63.88 (BTOC)	Time:	11:25 AM
Total Depth (Measured):	64.98 (BTOC)	Collection Order:	1
Depth to Water (Measured):	34.01 (BTOC)		

Is well screen occluded more than 10%? No
If Yes, list steps for redevelopment:

LNAPL Present: No
If Yes, measured thickness =
DNAPL Present: No
If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT Yes
Well ID present and readable: Yes
Locks intact: Yes
Weep hole present: No
Water present in protector: No
Are well "markers" (i.e.bumper posts) needed at this location: No
If yes, are current well "markers" adequate around well:
Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: Yes
Any observed ponding: No
Is surface run-off flow evident around well: No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches
Marking point present: Yes
Well cap in place: Yes
Comments:

General Comments:

Well protector surrounded by sand.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07	Date:	11/27/2023
Total Depth (Actual):	62.39 (BTOC)	Time:	12:45 PM
Total Depth (Measured):	63.84 (BTOC)	Collection Order:	10
Depth to Water (Measured):	31.00 (BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08	Date:	11/27/2023
Total Depth (Actual):	62.36 (BTOC)	Time:	12:50 PM
Total Depth (Measured):	62.50 (BTOC)	Collection Order:	11
Depth to Water (Measured):	32.43 (BTOC)		

Is well screen occluded more than 10%? No
If Yes, list steps for redevelopment:

LNAPL Present: No
If Yes, measured thickness =
DNAPL Present: No
If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT Yes
Well ID present and readable: Yes
Locks intact: Yes
Weep hole present: No
Water present in protector: No
Are well "markers" (i.e.bumper posts) needed at this location: No
If yes, are current well "markers" adequate around well:
Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: No
Any observed ponding: No
Is surface run-off flow evident around well: No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches
Marking point present: Yes
Well cap in place: Yes
Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09	Date:	11/27/2023
Total Depth (Actual):	63.18 (BTOC)	Time:	12:00 PM
Total Depth (Measured):	63.55 (BTOC)	Collection Order:	5
Depth to Water (Measured):	36.81 (BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D	Date:	11/27/2023
Total Depth (Actual):	98.09 (BTOC)	Time:	12:35 PM
Total Depth (Measured):	99.25 (BTOC)	Collection Order:	8
Depth to Water (Measured):	29.05 (BTOC)		

Is well screen occluded more than 10%? No
If Yes, list steps for redevelopment:

LNAPL Present: No
If Yes, measured thickness =
DNAPL Present: No
If Yes, measured thickness =

Well Completion Type:

Condition of protector: INTACT Yes
Well ID present and readable: Yes
Locks intact: Yes
Weep hole present: No
Water present in protector: No
Are well "markers" (i.e.bumper posts) needed at this location: No
If yes, are current well "markers" adequate around well:
Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well: No
Any observed ponding: No
Is surface run-off flow evident around well: No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches
Marking point present: Yes
Well cap in place: Yes
Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S	Date:	11/27/2023
Total Depth (Actual):	62.55 (BTOC)	Time:	12:40 PM
Total Depth (Measured):	63.29 (BTOC)	Collection Order:	9
Depth to Water (Measured):	30.00 (BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

APPENDIX B IDPH ABANDONMENT INFORMATION FOR APW-05

Print Form

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 W. JEFFERSON ST.
SPRINGFIELD, IL 62761

WATER WELL SEALING FORM

PDF FILLABLE/SAVABLE

RETURN ALL COPIES TO IDPH OR LOCAL HEALTH DEPARTMENT

This form shall be submitted to this Department or the local health department not more than 30 days after a water well, boring or monitoring well is sealed. Such wells are to be sealed not more than 30 days after they are abandoned in accordance with the sealing requirements in the Illinois Water Well Construction Code. THE LOCAL HEALTH DEPARTMENT OR REGIONAL PUBLIC HEALTH DEPARTMENT MUST BE NOTIFIED AT LEAST 48 HOURS PRIOR TO SEALING.

1. Ownership (Name of Controlling Party) Grand Tower Energy Center

2. Well Location: Well Site Address 1820 Power Plant Rd City Grand Tower Zip 62942

Lot # Land I.D.# County Jackson Township 10S

Range 4W Section 14 SE Quarter of the NW Quarter of the SW Quarter

GPS: North Degrees 37 Minutes 39 Seconds 14.11 West Degrees 89 Minutes 30 Seconds 42.73

Report decimal minutes to minutes and seconds by multiplying the decimal part of the minutes by 60, e.g. latitude 38 degrees 46.07 minutes N would be latitude 38 degrees 46 minutes 4.2 seconds (0.07 x 60 = 4.2) N. Report GPS coordinates to the nearest 0.1 second.

3. Year Drilled 2017 4. Drilling Permit Number (and date, if known APW-5

5. Type of Well Monitoring 6. Total Depth (ft.) 60 Diameter (in.) 2

7. Formation clear of obstruction Yes

8. Detains of Plugging (bentonite, neat cement or other materials)

Filled with	Bentonite Chips	From (ft.)	60	to (ft.)	0
Kind of plug		From (ft.)		to (ft.)	
Filled with		From (ft.)		to (ft.)	
Kind of plug		From (ft.)		to (ft.)	
Filled with		From (ft.)		to (ft.)	
Kind of plug		From (ft.)		to (ft.)	

9. CASING RECORD Upper 2 feet of casing removed Yes 10. Date well was sealed 02/07/2023

11. Licensed water well driller or other person approved by the Department performing well sealing

Name Bulldog Drilling Complete License Number N/R

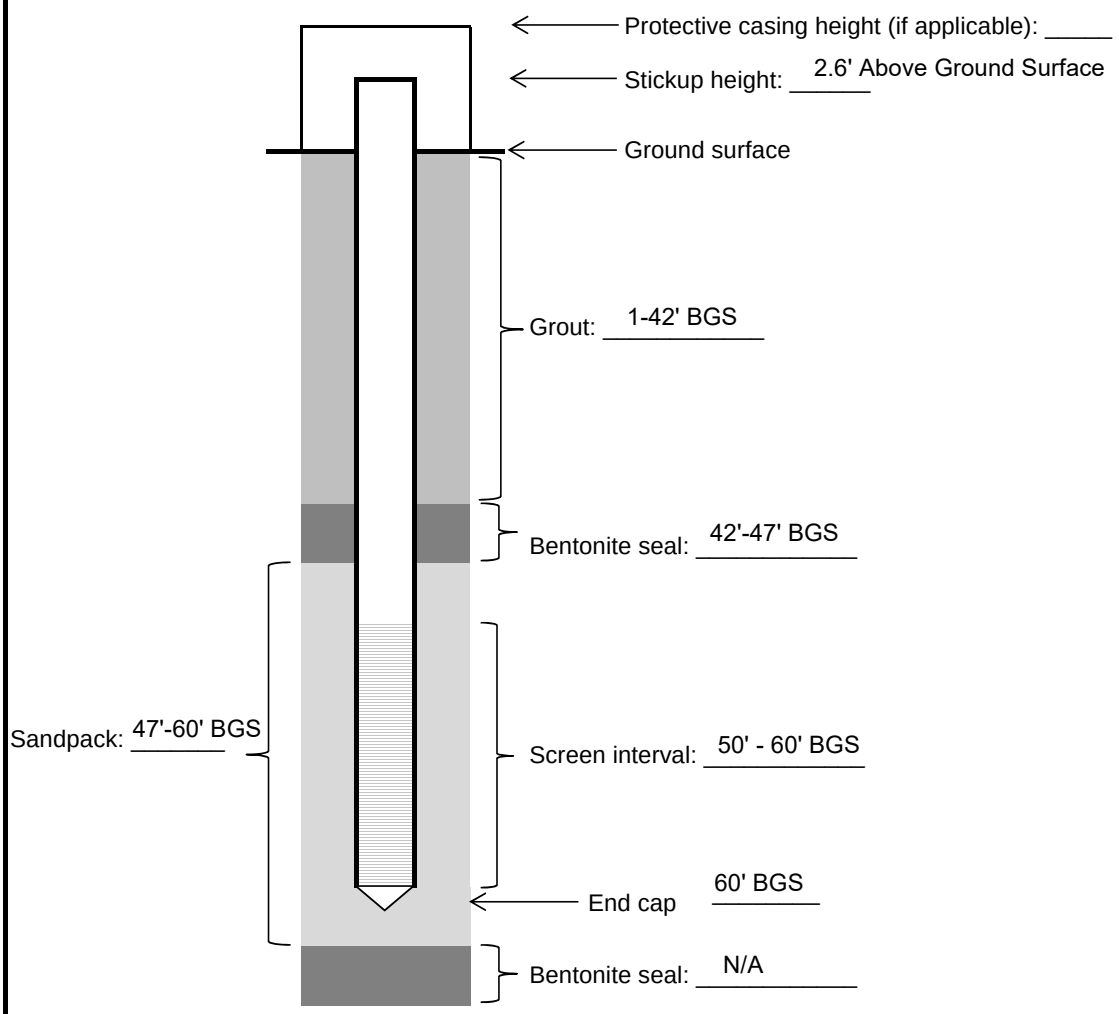
Address 411 Transpoint Dr. City Dupo State Illinois Zip Code 62239

This state agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center. IL 482-0631- Revised 5/09

Questions regarding the completion of this form should be directed to the local health department or the Illinois Department of Public Health 217-782-5830, TTY (for hearing impaired only) 800-547-0466.

MONITORING WELL CONSTRUCTION LOG (SINGLE SCREEN)
Location: APW-05R

Project Name:	Grand Tower Energy Center	Logged By:	M Abegg
Start Date and Time:	2/6/2023	Contractor:	Bulldog Drilling
End Date and Time:	2/6/2023	Driller:	R. Scharringhausen
Weather:	30 F, Sunny	Drilling Method	Hollow Stem Auger
Depth to Water:	33.87'	Drill Rig Model:	CME
Boring Depth:	60 ft.	Boring Diameter:	6.25"



RISER & SCREEN
Type: PVC
Schedule: Schedule 40
Diameter: 2"
Screen Slot Size (in): 0.01"
Centralizer Information: N/A

GROUT & BENTONITE
Grout Type: "Quik-Grout"
Hydration Details: 20% Solids
Bentonite Type: "Pel-Plug" 3/8" pellets
Hydration Details:

SANDPACK
Type: #11 sand

GROUND SURFACE COMPLETION
Type: Stickup w/ 1' concrete pad
Other info (padlock added, etc):

WATER USED DURING DRILLING
Water used in alluvium (gals): NA
Overdrilling (gals): NA
Water used in bedrock (gals): NA
Water recovered (gals): NA

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-05R | [X] Development [ ] Purging | Date: 2/7/2023 | Time Start: 1040 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring | Project Manager/Samplers: M. Abegg | Project No.: 0599247

Client Company: Grand Tower Energy Center | Project/Task No.:

Site Name: GTEC Landfill | Site Address:

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [ ] Stabilization of Indicator Parameters
- [X] Other: Visual turbidity and volume

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 62.98 (TOC) 60.00 (BGS)
Screen Interval: to
Initial Depth to Water (feet): 33.87 (TOC)
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [ ] Other:

Method of Purge/Development

Pump
- [ ] Submersible (s)
- [ ] Peristaltic (p)
- [X] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing	4.75 gal		
Gravel Pack			
Drilling Fluids			
Total			

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: Date/Time:
Analysis:
QA/QC Samples:

Stabilization Data

Time	Purge Rate Vol (ml)	Purge Rate Time(sec)	Removal Rate (mL/min) v/t*60	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons) Increment	Water Volume Removed (gallons) Cumulative	pH	Sp. Cond (µS/cm)	Temp (^{o}C)	DO (mg/L)	ORP (mV)	Turbidity	Comments
1117					34.10		Initial	6.90	1469	15.5	1.12	128.4	NM	Turbid dark brown
1121					34.10		10.0	7.13	915.000	15.6	0.73	33.40	NM	Slightly turbid brown
1130					34.10		20.0	7.21	940.000	15.3	0.75	-20.40	NM	Slightly turbid brown
1137					34.10		30.0	7.25	958.000	15.3	0.47	-50.70	NM	Clear
1145					34.10		40.0	7.26	970.000	15.1	0.52	-66.10	NM	Clear

Comments/Well Condition: Surged well with slug for appoximately 15 minutes prior to pumping. Stick up height from ground surface is ~2.6 ft.

Signature (s):  Date 2/7/2023 Reviewer Date

APPENDIX C FIELD DATA FORMS

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-01R
Well Permit No:

Date: 2023/02/02
Cloudy 40 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.23 (ft)	**Reference Elevation** 366.82 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 35.45 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 58.23 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 428.6 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 48.3 - 58.3 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 12.2 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
14:31	35.47	500	0	11.3	6.95	332.9	NM	1.97	107.5	581	NM	Turbid brown, no odor
14:36	35.47	450	0.5	12.9	6.17	396.8	NM	1.24	120.2	444	NM	Turbid brown, no odor
14:41	35.47	450	1	13.1	6.15	445.9	NM	1.33	112.9	403	NM	Turbid brown, no odor
14:46	35.47	400	1.5	13	6.19	471.4	NM	1.13	97.1	196	NM	Sl. turbid brown, no odor
14:51	35.47	400	2	13.3	6.23	482.9	NM	1.08	91.2	93.6	NM	Cloudy, no odor
14:56	35.47	400	2.5	13.4	6.25	498.2	NM	1.08	89	91.7	NM	Cloudy, no odor
15:01	35.47	400	3	13.3	6.29	507.2	NM	1.09	89.9	89.5	NM	Cloudy, no odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-01R-WG-20230202			
Analysis: IAC Title 34 Section 845.600 groundwater parameters		Clay Sansoucie 	02/12/2023 16:06

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-02
Well Permit No:

Date: 2023/02/01
Partly cloudy 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 53.55 (ft)	**Reference Elevation** 364.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.15 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 58.55 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 250 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 47.2 - 57.2 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 14.14 (gal) / 2 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
13:08	33.67	250	0	12.6	7.2	1131	NM	0.54	-79.6	130	NM	Cloudy, rotten egg like odor
13:13	34.93	250	0.25	12.7	7.11	1143	NM	0.16	-98.6	336	NM	Sl. Turbid, rotten egg like odor
13:18	36.47	250	0.5	13.3	7.32	1139	NM	0.14	-104	191	NM	Sl. Turbid, rotten egg like odor
13:23	37.79	250	1	13.6	7.1	1132	NM	0.12	-108	133	NM	Sl. Turbid, rotten egg like odor
13:28	38.84	250	1.25	13.6	7.15	1130	NM	0.11	-110.1	111	NM	Cloudy, rotten egg like odor
13:33	39.76	250	1.5	13.5	7.16	1126	NM	0.1	-110.2	96.9	NM	Cloudy, rotten egg like odor
13:38	40.63	250	1.75	13.6	7.14	1124	NM	0.11	-109.7	94.7	NM	Cloudy, rotten egg like odor
13:43	41.26	250	2	13.6	7.15	1124	NM	0.12	-109.6	93.6	NM	Cloudy, rotten egg like odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-02-WG-20230201,DUP-02-WG-20230201			
Analysis: IAC Title 34 Section 845.600 groundwater parameters		Clay Sansoucie 	02/12/2023 16:08

Low Flow Groundwater Sampling Field Data Form

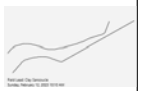
Well ID: APW-03
Well Permit No:

Date: 2023/01/30
Cloudy 23 Deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 54.42 (ft)	**Reference Elevation** 365.79 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.95 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 59.42 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 463.5 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7ft ()
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 14.17 (gal) / 5.75 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
12:15	32.91	575	0	11.8	6.24	798	NM	1.06	87.3	217	NM	Sl. Turbid, no odor
12:20	32.91	200	0.5	10.5	6.67	801	NM	0.98	44.9	300	NM	Sl. Turbid, no odor
12:25	32.92	350	1	12.5	6.99	808	NM	0.5	-16.9	213	NM	Sl. Turbid, no odor
12:30	32.92	400	1.5	12	7.18	813	NM	0.39	-41.4	230	NM	Sl. Turbid, no odor
12:40	32.92	500	1.75	12	7.27	818	NM	0.5	-26.5	176	NM	Sl. Turbid, no odor
12:45	32.92	500	2.25	12.6	7.36	818	NM	0.34	-53.9	288	NM	Sl. Turbid, no odor
12:50	32.92	500	2.75	12.7	7.4	827	NM	0.29	-63.3	204	NM	Sl. Turbid, no odor
12:55	32.92	500	3.25	12.8	7.4	829	NM	0.23	-67	142	NM	Cloudy, no odor
13:00	32.92	500	3.75	12.8	7.4	829	NM	0.2	-69.1	112	NM	Cloudy, no odor
13:05	32.92	500	4.25	12.8	7.4	827	NM	0.18	-69.6	67.4	NM	Clear, no odor
13:10	32.92	500	4.75	12.6	7.4	827	NM	0.15	-69.9	49.5	NM	Clear, no odor
13:15	32.92	500	5.25	12.6	7.4	825	NM	0.14	-69.7	52.1	NM	Clear, no odor
13:20	32.92	500	5.75	12.7	7.39	824	NM	0.14	-69.6	50.7	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-03-WG-20230130	Had pump problems at 1233. Had to switch to our backup pump and started pumping again at 1240	Clay Sansoucie 	02/12/2023 16:10
Analysis: IAC Title 34 Section 845.600 groundwater parameters			

Low Flow Groundwater Sampling Field Data Form

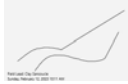
Well ID: APW-04
Well Permit No:

Date: 2023/02/02
Sunny 40 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 55.35 (ft)	**Reference Elevation** 367.44 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 36.19 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 60.35 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 ft()
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 12.94 (gal) / 2.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
13:35	36.19	450	0	10.8	7.46	576.3	NM	4.82	71.8	156	NM	Sl. Turbid brown, no odor
13:40	36.19	450	0.5	13.1	7.15	631.4	NM	0.5	65.1	128	NM	Sl. Turbid brown, no odor
13:45	36.19	450	1	13.2	7.12	636.7	NM	0.22	59.2	62.5	NM	Cloudy, no odor
13:50	36.19	450	1.5	13.3	7.12	635.7	NM	0.25	56.9	38.9	NM	Clear, no odor
13:55	36.19	450	2	13.6	7.12	634.9	NM	0.25	54.6	37.8	NM	Clear, no odor
14:00	36.19	450	2.5	13.4	7.12	634.7	NM	0.24	54.2	37.3	NM	Clear, no odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-04-WG-20230202		Clay Sansoucie 	02/12/2023 16:11
Analysis: IAC Title 34 Section 845.600 groundwater parameters			

Low Flow Groundwater Sampling Field Data Form

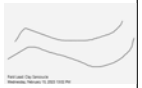
Well ID: APW-05
Well Permit No:

Date: 2023/02/01
Partly cloudy 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 52.5 (ft)	**Reference Elevation** 363.8 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.07 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 57.5 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 385.7 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 13.62 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
11:50	32.13	600	0	12	7.17	932	NM	0.77	8.6	21	NM	Clear, no odor
11:55	32.13	250	0.5	12.5	7.21	941	NM	0.2	-40.4	20.3	NM	Clear, no odor
12:00	32.13	250	1	10.9	7.24	943	NM	0.13	-47.2	10.3	NM	Clear, no odor
12:05	32.13	400	1.5	11.1	7.18	943	NM	0.11	-51.3	12	NM	Clear, no odor
12:10	32.13	400	2	13.1	7.21	943	NM	0.09	-58	8.53	NM	Clear, no odor
12:15	32.13	400	2.5	13.1	7.23	944	NM	0.08	-61.6	8.8	NM	Clear, no odor
12:20	32.13	400	3	13	7.22	942	NM	0.09	-62.7	8.21	NM	Clear, no odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-05-WG-20230201,DUP-01-WG-20230201			
Analysis: IAC Title 34 Section 845.600 groundwater parameters		Clay Sansoucie 	02/15/2023 19:02

Low Flow Groundwater Sampling Field Data Form

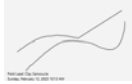
Well ID: APW-06D
Well Permit No:

Date: 2023/02/01
Cloudy 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 151.71 (ft)	**Reference Elevation** 363.69 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 31.57 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 156.71 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 352.8 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 140 - 150 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 67 (gal) / 8.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
09:27	31.6	300	0	9.7	7.82	790	NM	1.77	-62.3	134	NM	Cloudy, no odor
09:32	31.6	300	0.5	10.7	7.24	813	NM	10.5	-72.3	1000	NM	Turbid black, no odor
09:37	31.6	500	1	9.8	7.18	808	NM	9.58	-69.9	928	NM	Turbid black, no odor
09:42	31.6	350	1.5	11	7.23	807	NM	8.58	-69.2	584	NM	Turbid gray, no odor
09:47	31.6	350	2	12.1	7.21	806	NM	8.1	-69.6	225	NM	Turbid gray, no odor
09:52	31.6	350	2.5	11.4	7.28	808	NM	8.15	-69.8	203	NM	Cloudy, no odor
09:57	31.6	350	3	12.5	7.2	808	NM	7.03	-71.2	163	NM	Cloudy, no odor
10:02	31.6	350	3.5	12.2	7.23	809	NM	6.76	-70.8	155	NM	Cloudy, no odor
10:07	31.6	350	4	11.7	7.33	809	NM	6.47	-70.8	125	NM	Cloudy, no odor
10:12	31.6	350	4.5	12.1	7.24	811	NM	5.97	-71.9	104	NM	Cloudy, no odor
10:17	31.6	350	5	11.5	7.22	810	NM	5.89	-71.9	94.1	NM	Cloudy, no odor
10:22	31.6	350	5.5	11.4	7.22	810	NM	3.3	-73.4	70	NM	Cloudy, no odor
10:27	31.6	350	6	11.9	7.14	810	NM	2.94	-72.6	54.6	NM	Clear, no odor
10:32	31.6	350	6.5	12.1	7.17	806	NM	2.95	-72.6	46.6	NM	Clear, no odor
10:37	31.6	350	7	12.2	7.17	807	NM	2.91	-73.2	37.4	NM	Clear, no odor
10:42	31.6	350	7.5	11.5	7.19	809	NM	2.94	-73.1	27.9	NM	Clear, no odor
10:47	31.6	350	8	12	7.21	808	NM	2.89	-72.9	27.7	NM	Clear, no odor
10:52	31.6	350	8.5	12	7.22	810	NM	2.88	-72.9	26.9	NM	Clear, no odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-06D-WG-20230201			
Analysis: IAC Title 34 Section 845.600 groundwater parameters		Clay Sansoucie 	02/12/2023 16:13

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06S
Well Permit No:

Date: 2023/02/01
Cloudy 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 59.43 (ft)	**Reference Elevation** 363.51 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 31.15 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 64.43 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 472.2 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 17.82 (gal) / 4 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
08:22	31.2	500	0	7.8	7.7	888	NM	3.35	-96	203	NM	Sl. Turbid, rotten egg like odor
08:27	31.22	500	0.5	12.5	7.27	891	NM	0.52	-109.8	91.3	NM	Cloudy, rotten egg like odor
08:32	31.22	500	1	13.3	7.19	888	NM	0.33	-116.7	44	NM	Clear, rotten egg like odor
08:37	31.22	500	1.5	13.4	7.19	886	NM	0.24	-116.9	21.4	NM	Clear, rotten egg like odor
08:42	31.22	450	2	13	7.17	880	NM	0.22	-116.8	11	NM	Clear, rotten egg like odor
08:47	31.22	450	2.5	13.3	7.17	882	NM	0.14	-117.6	9.12	NM	Clear, no odor
08:52	31.22	450	3	13.3	7.16	879	NM	0.12	-118.3	6.86	NM	Clear, no odor
08:57	31.22	450	3.5	13	7.16	877	NM	0.12	-118.7	6.31	NM	Clear, no odor
09:02	31.22	450	4	13.1	7.15	876	NM	0.12	-118.4	6.67	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-06S-WG-20230201		Clay Sansoucie 	02/12/2023 16:14
Analysis: IAC Title 34 Section 845.600 groundwater parameters			

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-07 Well Permit No:	Date: 2023/01/30 Cloudy 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.18 (ft)	**Reference Elevation** 360.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 28 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.18 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 371.4 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 18.84 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
14:05	28.03	300	0	10.4	6.73	1213	NM	0.76	-37.6	131	NM	Cloudy, no odor
14:10	28.03	300	0.5	8.5	6.73	1227	NM	0.7	-50	160	NM	Cloudy, no odor
14:15	28.03	400	1	11.1	6.73	1220	NM	0.49	-56.5	107	NM	Clear, no odor
14:20	28.03	400	1.5	11.4	6.77	1223	NM	0.32	-62.9	98.1	NM	Clear, no odor
14:25	28.03	400	2	11	6.76	1222	NM	0.33	-65.3	85.3	NM	Clear, no odor
14:30	28.03	400	2.5	11.3	6.77	1221	NM	0.24	-67.5	81.7	NM	Clear, no odor
14:35	28.03	400	3	10.9	6.77	1223	NM	0.2	-68.8	79.2	NM	Clear, no odor

Sample ID(s): APW-07-WG-20230130	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
Analysis: IAC Title 34 Section 845.600 groundwater parameters		Clay Sansoucie 	02/15/2023 18:47

Low Flow Groundwater Sampling Field Data Form

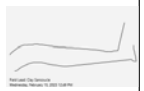
Well ID: APW-08
Well Permit No:

Date: 2023/02/02
Cloudy 20 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 56.75 (ft)	**Reference Elevation** 362.71 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 31.07 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 61.75 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 359.4 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 16.43 (gal) / 7.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
08:30	31.07	400	0	13.3	7.55	424.5	NM	0.33	-54.6	1000	NM	Very turbid brown, no odor
08:35	31.07	400	0.5	12.6	7.3	436.5	NM	0.18	-46.6	1000	NM	Very turbid brown, no odor
08:40	31.07	400	1	12.4	7.13	433.4	NM	0.19	-35.1	675	NM	Very turbid brown, no odor
08:45	31.07	350	1.5	13	7.14	423.9	NM	0.18	-29.1	382	NM	Turbid lt. brown, no odor
08:50	31.07	350	2	12.7	7.13	422.9	NM	0.22	-24	256	NM	Turbid lt. brown, no odor
08:55	31.07	350	2.5	12.4	7.13	422.1	NM	0.26	-19.6	176	NM	Turbid lt. brown, no odor
09:00	31.07	350	3	12.4	7.13	423.3	NM	0.21	-16.2	103	NM	Cloudy, no odor
09:05	31.07	350	3.5	12.4	7.12	421.4	NM	0.18	-13.4	71.3	NM	Cloudy, no odor
09:10	31.07	350	4	12.2	7.12	420	NM	0.17	-10.8	62.1	NM	Cloudy, no odor
09:15	31.07	350	4.5	12.6	7.13	421.1	NM	0.16	-9.2	49.5	NM	Cloudy, no odor
09:20	31.07	350	5	12.2	7.12	421.5	NM	0.16	-6.6	42.2	NM	Clear, no odor
09:25	31.07	350	5.5	11.9	7.11	420.8	NM	0.16	-3.6	39	NM	Clear, no odor
09:30	31.07	350	6	12.7	7.13	544.5	NM	0.13	-1.3	32.2	NM	Clear, no odor
09:35	31.07	350	6.5	12.7	7.11	543.4	NM	0.14	3.1	28.3	NM	Clear, no odor
09:40	31.07	350	7	12.8	7.11	541.7	NM	0.13	3.4	26.6	NM	Clear, no odor
09:45	31.07	350	7.5	12.8	7.11	542.4	NM	0.13	3.8	26.9	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-08-WG-20230202		Clay Sansoucie 	02/15/2023 18:49
Analysis: IAC Title 34 Section 845.600 groundwater parameters			

Low Flow Groundwater Sampling Field Data Form

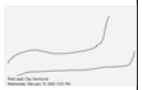
Well ID: APW-09
Well Permit No:

Date: 2023/02/01
Cloudy 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 58.18 (ft)	**Reference Elevation** 366.84 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 34.66 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.18 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 394.4 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 15.27 (gal) / 4 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
15:02	34.67	400	0	10.5	7.41	513	NM	1.24	-20.8	250	NM	Sl. turbid, no odor
15:07	34.67	300	0.5	12.3	7.3	545.6	NM	0.85	18.7	230	NM	Sl. turbid, no odor
15:12	34.67	450	1	13.3	7.29	544.1	NM	0.67	27.6	118	NM	Cloudy, no odor
15:17	34.67	400	1.5	13.2	7.28	545.5	NM	0.58	32.3	64.8	NM	Clear, no odor
15:22	34.67	400	2	13.4	7.28	544.8	NM	0.57	32.4	55.4	NM	Clear, no odor
15:27	34.67	400	2.5	13.2	7.27	545.1	NM	0.55	33.1	33.8	NM	Clear, no odor
15:32	34.67	400	3	13.2	7.28	545.4	NM	0.54	32.4	24.1	NM	Clear, no odor
15:37	34.67	400	3.5	13.5	7.28	545.3	NM	0.52	31.4	22	NM	Clear, no odor
15:42	34.67	400	4	13.4	7.29	545.5	NM	0.51	31.6	23.6	NM	Clear, no odor

Sample ID(s): APW-09-WG-20230201	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis: IAC Title 34 Section 845.600 groundwater parameters		Clay Sansoucie 	02/15/2023 18:51

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10D
Well Permit No:

Date: 2023/02/02
Sunny 30 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 93.15 (ft)	**Reference Elevation** 359.41 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.31 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 98.15 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 441.7 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 86 - 96 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 37.93 (gal) / 5.25 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
11:31	27.35	450	0	7.7	7.17	818	NM	4.84	-80.2	65.4	NM	Clear, no odor
11:36	27.35	250	0.5	11.9	6.98	695	NM	0.53	-55.4	1000	NM	Turbid gray, no odor
11:41	27.35	400	1	12.5	6.95	695	NM	0.18	-46.5	1000	NM	Turbid gray, no odor
11:46	27.35	200	1.5	12.1	6.96	694	NM	0.16	-38.6	935	NM	Turbid gray, no odor
11:51	27.35	500	1.75	13.5	6.94	692	NM	0.15	-30.9	608	NM	Turbid gray, no odor
11:56	27.35	500	2.25	13.2	6.96	691	NM	0.16	-25.1	389	NM	Turbid gray, no odor
12:01	27.35	500	2.75	13.5	6.95	686	NM	0.1	-20.9	240	NM	Turbid gray, no odor
12:06	27.35	500	3.25	13.5	6.95	688	NM	0.08	-14.7	176	NM	Cloudy, no odor
12:11	27.35	500	3.75	13.5	6.95	689	NM	0.07	-14.5	73.7	NM	Cloudy, no odor
12:16	27.35	500	4.25	13.6	6.95	691	NM	0.06	-11.4	48.9	NM	Clear, no odor
12:21	27.35	500	4.75	13.7	6.95	691	NM	0.06	-10.1	46.8	NM	Clear, no odor
12:26	27.35	500	5.25	13.7	6.95	692	NM	0.05	-10.5	45.3	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-10D-WG-20230202		Clay Sansoucie 	03/08/2023 18:29
Analysis: IAC Title 34 Section 845.600 groundwater parameters			

Low Flow Groundwater Sampling Field Data Form

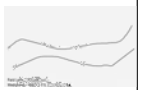
Well ID: APW-10S
Well Permit No:

Date: 2023/02/02
Sunny 25 deg F

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low Flow / 57.78 (ft)	**Reference Elevation** 359.47 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.43 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 62.78 (ft)
Project Name 20230130-GWMonitor	**Average Purge Rate** 411.1 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 18.93 (gal) / 4 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
10:22	27.6	450	0	10.9	6.9	1141	NM	1.07	-76.8	64.4	NM	Cloudy, no odor
10:27	27.6	500	0.5	11.5	6.97	1141	NM	0.26	-101.9	1000	NM	Very turbid black, rotten egg like odor
10:32	27.6	350	1	12.9	6.98	1136	NM	0.2	-111.3	1000	NM	Very turbid black, rotten egg like odor
10:37	27.6	400	1.5	12.8	6.98	1076	NM	0.16	-112.9	305	NM	Turbid dark gray, rotten egg like odor
10:42	27.6	400	2	13.8	6.98	1035	NM	0.13	-115.8	186	NM	Cloudy, rotten egg like odor
10:47	27.6	400	2.5	13.9	6.98	1021	NM	0.12	-115.9	105	NM	Cloudy, rotten egg like odor
10:52	27.6	400	3	13.7	6.98	997	NM	0.1	-117	38.2	NM	Clear, rotten egg like odor
10:57	27.6	400	3.5	13.8	6.99	996	NM	0.11	-117.8	35.2	NM	Clear, rotten egg like odor
11:02	27.6	400	4	13.7	6.99	996	NM	0.1	-118.2	37.3	NM	Clear, rotten egg like odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-10S-WG-20230202		Clay Sansoucie 	02/15/2023 18:53
Analysis: IAC Title 34 Section 845.600 groundwater parameters			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-02
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.43 (ft)	**Reference Elevation** 364.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.77 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 58.43 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 159.1 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 47.2 - 57.2(ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.19 (gal) / 1.4 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
11:20	33.96	250	0	24.1	7.04	1050	NM	4.97	279.6	1000	NM	OPAQUE BROWN & NO ODOR
11:25	35.37	150	0.5	24.1	6.77	1050	NM	4.97	279.6	1000	NM	OPAQUE BROWN & NO ODOR
11:30	36.09	150	0.6	22.6	6.74	1030	NM	1.69	255.2	1000	NM	OPAQUE BROWN & NO ODOR
11:35	36.91	150	0.7	21.2	6.68	1015	NM	1.92	245.6	517	NM	OPAQUE BROWN & NO ODOR
11:40	37.34	150	0.8	22.4	6.69	1007	NM	2.29	241.4	275	NM	TURBID BROWN & NO ODOR
11:45	37.68	150	0.9	23.2	6.69	1008	NM	2.23	241.3	219	NM	TURBID BROWN & NO ODOR
11:50	38.01	150	1	23.2	6.69	1009	NM	2.22	241.3	168	NM	TURBID BROWN & NO ODOR
11:55	38.62	150	1.1	22.6	6.69	1011	NM	2.08	239.9	141	NM	TURBID BROWN & NO ODOR
12:00	39	150	1.2	22.8	6.86	1013	NM	1.93	235.1	114	NM	CLOUDY & NO ODOR
12:05	39.41	150	1.3	22.9	6.84	1008	NM	1.9	231	112.6	NM	CLOUDY & NO ODOR
12:10	39.73	150	1.4	23.1	6.82	1012	NM	1.87	229	104.3	NM	CLOUDY & NO ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-02-WG-20230627,DUP-02-WG-20230627		Marshall Arendell 	07/05/2023 16:24
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-03
Well Permit No:

Date: 2023/06/26
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 54.42 (ft)	**Reference Elevation** 365.79 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.01 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 59.42 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 233.3 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.47 (gal) / 2.75 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
11:10	32.07	150	0	16.7	8.11	764	NM	1.22	142.4	200	NM	CLOUDY GRAY & NO ODOR
11:15	32.07	200	0.25	17.1	8.16	756	NM	0.54	138.9	174	NM	CLOUDY GRAY & NO ODOR
11:20	32.07	200	0.5	16.8	8.19	757	NM	0.38	129.3	115	NM	TURBID & NO ODOR
11:25	32.07	250	0.75	16.8	8.2	756	NM	0.3	122.2	78.1	NM	TURBID & NO ODOR
11:30	32.07	250	1	16.8	8.31	756	NM	0.25	100.9	46.7	NM	CLEAR & NO ODOR
11:35	32.07	250	1.25	16.8	8.32	753	NM	0.2	85.2	26.5	NM	CLEAR & SLIGHT ROTTEN-EGG LIKE ODOR
11:40	32.07	250	1.5	16.6	8.35	753	NM	0.18	74.4	17.7	NM	CLEAR & NO ODOR
11:45	32.07	250	1.75	16.5	8.37	754	NM	0.17	64.6	10.2	NM	CLEAR & NO ODOR
11:50	32.07	250	2	16.6	8.41	753	NM	0.15	54.2	6.05	NM	CLEAR & NO ODOR
11:55	32.07	250	2.25	16.6	8.42	752	NM	0.13	68.7	6.64	NM	CLEAR & NO ODOR
12:00	32.07	250	2.5	16.5	8.41	753	NM	0.13	73.5	6.22	NM	CLEAR & NO ODOR
12:05	32.07	250	2.75	16.5	8.39	754	NM	0.13	72.3	6.04	NM	CLEAR & NO ODOR

Sample ID(s): APW-03-WG-20230626	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/30/2023 14:33

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-04
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.28 (ft)	**Reference Elevation** 367.44 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.76 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 60.28 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 421.4 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.33 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
17:00	33.76	350	0	23.8	6.7	415.1	NM	6.66	330.9	351	NM	TURBID BROWN & NO ODOR
17:05	33.76	400	0.5	18.7	6.49	529.5	NM	2.26	296.9	86.6	NM	CLOUDY & NO ODOR
17:10	33.76	400	1	18.4	6.59	545.8	NM	1.05	288.5	52.8	NM	CLEAR & NO ODOR
17:15	33.76	450	1.5	18.3	6.68	548.1	NM	0.9	276.9	47.5	NM	CLEAR & NO ODOR
17:20	33.76	450	2	18.5	7.05	548.9	NM	0.73	289.2	41.5	NM	CLEAR & NO ODOR
17:25	33.76	450	2.5	18.5	7.04	549.8	NM	0.72	276.6	39.2	NM	CLEAR & NO ODOR
17:30	33.76	450	3	18.4	7.04	549.7	NM	0.72	276	38.7	NM	CLEAR & NO ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-04-WG-20230627		Marshall Arendell 	06/30/2023 14:47
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-05
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.89 (ft)	**Reference Elevation** 363.8 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.72 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 62.89 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 472.5 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.92 (gal) / 4.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
13:22	32.74	275	0	18	7.28	868	NM	2.85	188.9	360	NM	TURBID GREY & NO ODOR
13:27	32.74	450	0.5	18.1	7.31	871	NM	1.66	188.8	375	NM	TURBID GREY & ROTTEN-EGG LIKE ODOR
13:32	32.74	500	1	17.9	7.39	866	NM	0.91	182.3	335	NM	TURBID GREY & ROTTEN-EGG LIKE ODOR
13:37	32.74	500	1.5	18	7.48	865	NM	0.53	171.9	200	NM	TURBID GREY & ROTTEN-EGG LIKE ODOR
13:42	32.74	500	2	18	7.16	869	NM	0.34	175.3	131	NM	CLOUDY & NO ODOR
13:47	32.74	500	2.5	17.7	7.12	869	NM	0.29	173.3	92.9	NM	CLOUDY & NO ODOR
13:52	32.74	500	3	17.7	7.14	869	NM	0.2	170	60	NM	CLOUDY & NO ODOR
13:57	32.74	500	3.5	17.6	7.17	869	NM	0.16	169.4	41.1	NM	CLEAR & NO ODOR
14:02	32.74	500	4	17.6	7.17	872	NM	0.13	166.7	39.9	NM	CLEAR & NO ODOR
14:07	32.74	500	4.5	17.7	7.17	871	NM	0.13	166.3	42.6	NM	CLEAR & NO ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-05-WG-20230627,DUP-01-WG-20230627		Marshall Arendell 	06/30/2023 15:51
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06D
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 151.62 (ft)	**Reference Elevation** 363.69 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 30.77 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 156.62 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 344.4 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 140 - 150 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 20.54 (gal) / 3.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
09:50	30.82	350	0	17.3	7.47	699	NM	1.97	223.7	168	NM	TURBID GREY & ORGANIC LIKE ODOR
09:55	30.82	300	0.5	18.9	7.5	747	NM	0.67	213.9	1000	NM	OPAQUE DARK GREY & ORGANIC LIKE ODOR
10:00	30.82	350	0.75	18.4	7.76	752	NM	0.27	206.7	551	NM	OPAQUE DARK GREY & ORGANIC LIKE ODOR
10:05	30.82	350	1.25	18.1	7.87	762	NM	0.14	192.2	438	NM	OPAQUE DARK GREY & ORGANIC LIKE ODOR
10:10	30.82	350	1.75	18	8.03	762	NM	0.11	178.8	602	NM	OPAQUE DARK GREY & ORGANIC LIKE ODOR
10:15	30.82	350	2.25	17.8	8.01	765	NM	0.09	175	225	NM	TURBID GREY & ORGANIC LIKE ODOR
10:20	30.82	350	2.75	18.1	7.73	764	NM	0.08	171.9	177	NM	TURBID GREY & ORGANIC LIKE ODOR
10:25	30.82	350	3.25	18.9	7.73	768	NM	0.08	170	165	NM	TURBID GREY & ORGANIC LIKE ODOR
10:30	30.82	350	3.5	18.8	7.71	769	NM	0.08	170.6	181	NM	TURBID GREY & ORGANIC LIKE ODOR

Sample ID(s): APW-06D-WG-20230627	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/30/2023 17:35

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06S
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.83 (ft)	**Reference Elevation** 363.51 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 31.23 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.83 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 279.2 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.32 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
08:12	31.25	300	0	17.5	6.63	585	NM	6.12	380.2	139	NM	TURBID & NO ODOR
08:17	31.26	300	0.5	16.9	6.61	610	NM	1.45	345	96.8	NM	CLOUDY & NO ODOR
08:22	31.26	300	0.75	17.3	6.64	612	NM	0.84	322	61.8	NM	CLOUDY & NO ODOR
08:27	31.26	275	1	17.5	6.7	610	NM	0.63	306	29.6	NM	CLEAR & NO ODOR
08:32	31.26	250	1.25	17.5	6.73	621	NM	0.47	285.6	25	NM	CLEAR & NO ODOR
08:37	31.26	275	1.5	17.6	6.72	623	NM	0.34	268	20.1	NM	CLEAR & SLIGHT ROTTEN-EGG LIKE ODOR
08:42	31.26	275	1.75	17.7	6.97	622	NM	0.26	255.3	16	NM	CLEAR & SLIGHT ROTTEN-EGG LIKE ODOR
08:47	31.26	275	2	17.9	7.29	619	NM	0.21	242.8	14.1	NM	CLEAR & NO ODOR
08:52	31.26	275	2.25	18	7.49	620	NM	0.17	228	14.3	NM	CLEAR & NO ODOR
08:57	31.26	275	2.5	17.9	7.54	621	NM	0.15	213.2	9.19	NM	CLEAR & NO ODOR
09:02	31.26	275	2.75	18.1	7.61	619	NM	0.13	207.8	9.02	NM	CLEAR & NO ODOR
09:07	31.26	275	3	18.1	7.6	619	NM	0.14	206.3	9.06	NM	CLEAR & NO ODOR

Sample ID(s): APW-06S-WG-20230627	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/30/2023 16:44

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-07
Well Permit No:

Date: 2023/06/26
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.19 (ft)	**Reference Elevation** 360.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.73 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.19 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 371.4 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.79 (gal) / 3.25 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
14:45	27.82	500	0	19.2	7.77	819	NM	2.72	129	45.9	NM	CLEAR & NO ODOR
14:50	27.82	350	0.75	21.1	7.58	875	NM	0.41	113.5	37.9	NM	CLEAR & NO ODOR
14:55	27.82	350	1.25	20.6	7.88	886	NM	0.21	110	25.9	NM	CLEAR & NO ODOR
15:00	27.82	350	1.75	19.9	7.71	912	NM	0.16	109.8	18	NM	CLEAR & NO ODOR
15:05	27.82	350	2.25	20	7.62	917	NM	0.13	109	15.4	NM	CLEAR & NO ODOR
15:10	27.82	350	2.75	19.6	7.61	921	NM	0.11	107.1	15.2	NM	CLEAR & NO ODOR
15:15	27.82	350	3.25	20.1	7.59	923	NM	0.11	110.3	14.8	NM	CLEAR & NO ODOR

Sample ID(s): APW-07-WG-20230626	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/30/2023 18:16

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-08
Well Permit No:

Date: 2023/06/26
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 56.85 (ft)	**Reference Elevation** 362.71 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 28.52 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 61.85 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 336.2 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.44 (gal) / 5.25 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
13:13	28.54	150	0	27.1	7.59	565	NM	4.9	195.3	1000	NM	OPAQUE GREY & NO ODOR
13:18	28.54	150	0.5	20.7	7.63	567	NM	1.09	200.5	1000	NM	OPAQUE GREY & NO ODOR
13:23	28.54	200	0.75	25.8	7.35	587	NM	0.29	205.6	1000	NM	OPAQUE GREY & NO ODOR
13:28	28.54	420	1.25	22.1	7.45	571	NM	0.13	201.4	1000	NM	OPAQUE GREY & NO ODOR
13:33	28.54	350	1.5	22.3	7.43	579	NM	0.13	209.7	1000	NM	OPAQUE GREY & NO ODOR
13:38	28.54	375	1.75	23.7	7.29	576	NM	0.12	212.3	891	NM	OPAQUE GREY & NO ODOR
13:43	28.54	375	2.25	23.6	7.36	577	NM	0.12	205.6	580	NM	OPAQUE GREY & NO ODOR
13:48	28.54	350	2.75	24	7.45	573	NM	0.13	198.7	366	NM	OPAQUE GREY & NO ODOR
13:53	28.54	400	3.25	571	7.6	23.4	NM	0.19	197.9	249	NM	TURBID & NO ODOR
13:58	28.54	400	3.75	24.2	7.71	574	NM	0.19	180.9	190	NM	TURBID & NO ODOR
14:03	28.54	400	4.25	24	7.7	565	NM	0.2	181.2	159	NM	TURBID & NO ODOR
14:08	28.54	400	4.75	24.3	7.72	568	NM	0.2	182.6	151	NM	TURBID & NO ODOR
14:13	28.54	400	5.25	24.2	7.72	568	NM	0.2	183.2	152	NM	TURBID & NO ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-08-WG-20230626		Marshall Arendell 	06/30/2023 18:38
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-09
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.14 (ft)	**Reference Elevation** 366.84 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.66 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.14 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 425 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.97 (gal) / 2.75 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
14:51	32.67	450	0	19.1	6.9	298	NM	4.79	332.1	114	NM	CLOUDY & NO ODOR
14:56	32.67	450	0.75	18.2	6.9	404.1	NM	1.04	297	69.4	NM	CLOUDY & NO ODOR
15:01	32.67	450	1.25	17.9	6.92	506.6	NM	0.76	285.1	33.4	NM	CLEAR & NO ODOR
15:06	32.67	400	1.75	17.9	6.89	509.6	NM	0.67	277.8	26.4	NM	CLEAR & NO ODOR
15:11	32.67	400	2.25	17.6	6.88	513.1	NM	0.67	277.7	25.9	NM	CLEAR & NO ODOR
15:16	32.67	400	2.75	17.6	6.86	510.8	NM	0.66	277.8	24.7	NM	CLEAR & NO ODOR

Sample ID(s): APW-09-WG-20230627	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/30/2023 18:50

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10D
Well Permit No:

Date: 2023/06/26
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 93.07 (ft)	**Reference Elevation** 359.41 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 24.6 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 98.07 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 347.9 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 86 - 96 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 11.99 (gal) / 4.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
17:45	24.65	175	0	19	7.68	553.7	NM	2.67	122.8	117	NM	TURBID & NO ODOR
17:50	24.65	350	0.25	19.6	7.54	631	NM	1.49	131.5	699	NM	OPAQUE BROWN & NO ODOR
17:55	24.65	200	0.5	18.1	7.49	639	NM	0.69	138.4	1000	NM	OPAQUE BROWN & NO ODOR
18:00	24.65	150	0.75	18.8	7.4	643	NM	0.69	141.8	1000	NM	OPAQUE BROWN & NO ODOR
18:05	24.65	275	1	17.7	7.44	643	NM	0.49	145.3	1000	NM	OPAQUE BROWN & NO ODOR
18:10	24.65	375	1.25	17.1	7.47	641	NM	0.34	146.6	816	NM	OPAQUE BROWN & NO ODOR
18:15	24.65	450	2	17.1	7.45	640	NM	0.24	149	492	NM	OPAQUE BROWN & NO ODOR
18:20	24.65	400	2.5	17.1	7.5	637	NM	0.2	148.6	334	NM	OPAQUE BROWN & NO ODOR
18:25	24.65	450	3	17.1	7.49	636	NM	0.16	147.8	250	NM	TURBID & NO ODOR
18:30	24.65	450	3.5	16.9	7.43	635	NM	0.13	151.1	188	NM	TURBID & NO ODOR
18:35	24.65	450	4	16.9	7.43	634	NM	0.13	151.5	180	NM	TURBID & NO ODOR
18:40	24.65	450	4.5	16.9	7.41	634	NM	0.13	152.5	176	NM	TURBID & NO ODOR

Sample ID(s): APW-10D-WG-20230626	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/30/2023 19:19

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10S
Well Permit No:

Date: 2023/06/26
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.75 (ft)	**Reference Elevation** 359.47 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 26.75 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 62.75 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 305 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.88 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
16:10	26.87	250	0	24.7	7.01	1171	NM	5.01	241	1000	NM	OPAQUE DARK GREY & NO ODOR
16:15	26.88	300	0.25	18.4	6.94	1176	NM	2.55	216.4	1000	NM	OPAQUE DARK GREY & NO ODOR
16:20	26.91	250	0.5	21.7	7.47	1164	NM	1.68	186	1000	NM	OPAQUE DARK GREY & NO ODOR
16:25	26.98	350	1	20.7	7.51	1170	NM	1.12	152.1	422	NM	OPAQUE DARK GREY & ROTTEN-EGG LIKE ODOR
16:30	26.98	300	1.25	20.1	7.56	1173	NM	0.95	131.3	174	NM	TURBID GREY & ROTTEN-EGG LIKE ODOR
16:35	26.98	400	1.75	20	7.56	1173	NM	0.76	118	91.1	NM	TURBID GREY & ROTTEN-EGG LIKE ODOR
16:40	26.98	300	2.25	20.3	7.57	1172	NM	0.87	106.2	316	NM	TURBID GREY & ROTTEN-EGG LIKE ODOR
16:45	26.98	300	2.5	20.5	7.66	1174	NM	0.5	93.3	56.7	NM	CLOUDY & ROTTEN-EGG LIKE ODOR
16:50	26.98	300	2.75	20.9	7.65	1173	NM	0.49	86.5	60.2	NM	CLOUDY & ROTTEN-EGG LIKE ODOR
16:55	26.98	300	3	20.8	7.64	1173	NM	0.48	87.3	57.2	NM	CLOUDY & ROTTEN-EGG LIKE ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-10S-WG-20230626		Marshall Arendell 	06/30/2023 19:36
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-01R
Well Permit No:

Date: 2023/06/27
sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 51.22 (ft)	**Reference Elevation** 366.82 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.22 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 56.22 (ft)
Project Name 20230626-GWMonitor	**Average Purge Rate** 375 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 48.3 - 58.3 (ft)
Sampler Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 3.75 (gal) / 3.75 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
15:39	33.22	350	0	20	6.27	291.2	NM	5.76	389.4	223	NM	TURBID BROWN & NO ODOR
15:44	33.22	350	0.25	20.2	5.93	329.3	NM	2.47	334.1	732	NM	OPAQUE BROWN & NO ODOR
15:49	33.22	325	0.5	19.9	5.88	310.9	NM	2.08	344.7	562	NM	OPAQUE BROWN & NO ODOR
15:54	33.22	350	0.75	19.6	5.85	359.5	NM	1.9	301.4	446	NM	OPAQUE BROWN & NO ODOR
15:59	33.22	350	1	19.5	5.87	380.2	NM	1.66	294.1	255	NM	TURBID BROWN & NO ODOR
16:04	33.22	300	1.25	19	5.86	390.2	NM	1.53	290.9	195	NM	TURBID BROWN & NO ODOR
16:09	33.22	300	1.75	19.9	5.89	403.2	NM	1.41	288	143	NM	TURBID BROWN & NO ODOR
16:14	33.22	400	2.25	20.4	5.93	410.7	NM	1.41	284.5	99.1	NM	CLOUDY & NO ODOR
16:19	33.22	400	2.75	18.8	5.9	418.6	NM	1.34	281.3	91.2	NM	CLOUDY & NO ODOR
16:24	33.22	400	3.25	18.7	5.89	421.3	NM	1.33	280.2	89.6	NM	CLOUDY & NO ODOR
16:29	33.22	400	3.75	18.9	5.9	424.7	NM	1.33	279.5	83.2	NM	CLOUDY & NO ODOR

Sample ID(s): APW-01R-WG-20230627	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	06/29/2023 21:32

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-01R
Well Permit No:

Date: 2023/09/20
78 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.21 (ft)	**Reference Elevation** 366.82 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 37.43 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 58.21 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 318.8 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 48.3 - 58.3 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 11.13 (gal) / 3 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
14:30	37.45	350	0	20.3	6.88	339	NM	6.86	142	314	NM	Turbid brown, no odor
14:35	37.45	350	0.5	17.9	6.16	452	NM	2.01	147.7	388	NM	Turbid brown, no odor
14:40	37.45	350	1	17.9	6.26	477	NM	0.89	135	297	NM	Turbid brown, no odor
14:45	37.45	300	1.25	17.9	6.33	489	NM	0.8	127.3	234	NM	Cloudy, no odor
14:50	37.45	300	1.75	17.9	6.34	502	NM	0.76	122.9	164	NM	Cloudy, no odor
14:55	37.45	300	2	17.9	6.36	509	NM	0.76	119.6	138	NM	Cloudy, no odor
15:00	37.45	300	2.5	17.7	6.36	517	NM	0.75	118.2	129	NM	Cloudy, no odor
15:05	37.45	300	3	17.7	6.35	517	NM	0.76	117.4	133	NM	Cloudy, no odor

Sample ID(s): APW-01R-WG-20230920	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 14:45

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-02
Well Permit No:

Date: 2023/09/20
75 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.4 (ft)	**Reference Elevation** 364.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 34.92 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 58.4 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 193.8 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 47.2 - 57.2 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 12.57 (gal) / 1.75 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
11:52	37	250	0	25.5	7.17	1113	NM	3.6	57.3	123	NM	Clear, no odor
11:57	38.19	100	0.25	20	7.03	1114	NM	1.89	61.6	379	NM	Cloudy, no odor
12:02	38.96	200	0.5	19.2	7.07	1118	NM	1.23	40.9	299	NM	Cloudy, no odor
12:07	39.61	200	0.75	19.7	7.1	1107	NM	1.11	25	173	NM	Cloudy, no odor
12:12	40.45	200	1	19.5	7.1	1108	NM	1.01	15.3	113	NM	Cloudy, no odor
12:17	40.98	200	1.25	20	7.09	1099	NM	0.95	8.4	105	NM	Cloudy, no odor
12:22	41.51	200	1.5	20.3	7.08	1101	NM	0.99	7.4	103.4	NM	Cloudy, no odor
12:27	41.8	200	1.75	20.3	7.08	1100	NM	0.96	7.3	97	NM	Cloudy, no odor

Sample ID(s): APW-02-WG-20230920	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 15:11

Low Flow Groundwater Sampling Field Data Form

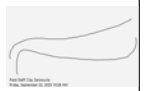
Well ID: APW-03
Well Permit No:

Date: 2023/09/19
75 deg F Sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 54.42 (ft)	**Reference Elevation** 365.79 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 36.45 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 59.42 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 350 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 12.3 (gal) / 3.25 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
10:56	36.45	350	0	16.5	6.33	812	NM	4.51	319.3	66.9	NM	Cloudy, Sl. Rotten Egg Like Odor
11:01	36.45	350	0.5	15.5	7.07	827	NM	0.19	255.2	75.9	NM	Cloudy, No odor
11:06	36.45	350	0.75	15.5	7.51	842	NM	0.13	224.5	41.9	NM	Cloudy, No odor
11:11	36.45	350	1.25	15.5	7.74	843	NM	0.1	208.5	16.1	NM	Cloudy, No odor
11:16	36.45	350	1.75	15.4	7.83	845	NM	0.09	197.7	8.38	NM	Clear, No odor
11:21	36.45	350	2.25	15.4	7.85	845	NM	0.09	186.7	4.69	NM	Clear, No odor
11:26	36.45	350	2.75	15.5	7.8	845	NM	0.09	183.9	3.12	NM	Clear, No odor
11:31	36.45	350	3.25	15.5	7.8	846	NM	0.09	181.6	2.72	NM	Clear, No odor

Sample ID(s): APW-03-WG-20230919	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 15:28

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-04
Well Permit No:

Date: 2023/09/20
78 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.25 (ft)	**Reference Elevation** 367.44 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 38.07 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 60.25 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 378.1 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 11.88 (gal) / 3.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
15:30	38.07	400	0	18	7.05	512	NM	4.23	149.7	363	NM	Turbid brown, no odor
15:35	38.07	375	0.5	17	7.02	612	NM	0.43	137	147	NM	Cloudy, no odor
15:40	38.07	250	1	17.5	7.11	630	NM	0.26	122.7	50.6	NM	Cloudy, no odor
15:45	38.07	400	1.5	16.9	7.1	649	NM	0.14	116.5	25.3	NM	Clear, No odor
15:50	38.07	400	2	16.8	7.13	657	NM	0.11	110.6	33.6	NM	Clear, No odor
15:55	38.07	400	2.5	16.8	7.12	658	NM	0.08	106.4	23.8	NM	Clear, No odor
16:00	38.07	400	3	16.8	7.13	659	NM	0.08	104.1	22.7	NM	Clear, No odor
16:05	38.07	400	3.5	16.8	7.13	659	NM	0.08	101	21.6	NM	Clear, No odor

Sample ID(s): APW-04-WG-20230920	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 16:13

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-05R
Well Permit No:

Date: 2023/09/20
68 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.93 (ft)	**Reference Elevation** 363.8 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 36.19 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 62.93 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 14.32 (gal) / 5.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
10:26	36.2	400	0	18	7.37	946	NM	4.16	66.6	861	NM	Turbid grey, No odor
10:31	36.2	400	0.5	17	7.29	954	NM	2.56	61.8	875	NM	Turbid grey, No odor
10:36	36.2	400	1	17.2	7.36	951	NM	1.28	45.3	858	NM	Turbid grey, No odor
10:41	36.2	400	1.5	17	7.35	951	NM	0.87	32.4	466	NM	Turbid grey, No odor
10:46	36.2	400	2	17	6.9	955	NM	0.7	17.6	225	NM	Cloudy Grey, Organic like odor
10:51	36.2	400	2.5	17.1	7.37	958	NM	0.63	8.6	138	NM	Cloudy Grey, Organic like odor
10:56	36.2	400	3	17.1	7.36	959	NM	0.54	-0.3	89.3	NM	Cloudy Grey, Organic like odor
11:01	36.2	400	3.5	17.2	7.37	960	NM	0.45	-8.1	57.5	NM	Clear, Organic like odor
11:06	36.2	400	4	17.3	7.36	961	NM	0.37	-14.9	46	NM	Clear, Organic like odor
11:11	36.2	400	4.5	17.4	7.37	961	NM	0.3	-20.4	35.9	NM	Clear, Organic like odor
11:16	36.2	400	5	17.4	7.37	962	NM	0.29	-21.5	34.2	NM	Clear, Organic like odor
11:21	36.2	400	5.5	17.4	7.36	962	NM	0.29	-20.9	33.7	NM	Clear, Organic like odor

Sample ID(s): APW-05R-WG-20230920,DUP-01-WG-20230920	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 17:34

Low Flow Groundwater Sampling Field Data Form

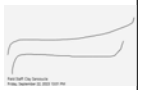
Well ID: APW-06D
Well Permit No:

Date: 2023/09/20
60 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 149.8 (ft)	**Reference Elevation** 363.69 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 35.03 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 154.8 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 454.5 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 140 - 150 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 64.13 (gal) / 5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
09:10	35.03	500	0	18	7.42	772	NM	4.57	47.3	7.01	NM	Clear, Organic Like Odor
09:15	35.03	450	0.5	16.1	7.24	793	NM	1.52	36.9	611	NM	Turbid grey, Organic Like Odor
09:20	35.03	450	1	16	7.28	800	NM	0.62	28.8	311	NM	Turbid grey, Organic Like Odor
09:25	35.03	450	1.5	16	7.31	804	NM	0.49	22.3	202	NM	Turbid grey, Organic Like Odor
09:30	35.03	450	2	15.9	7.3	805	NM	0.4	17.8	164	NM	Cloudy, Organic Like Odor
09:35	35.03	450	2.5	15.9	7.3	805	NM	0.33	13.4	120	NM	Cloudy, Organic Like Odor
09:40	35.03	450	3	15.9	7.3	804	NM	0.29	8.8	80.3	NM	Cloudy, Organic Like Odor
09:45	35.03	450	3.5	15.9	7.3	803	NM	0.26	4.3	57.8	NM	Clear, Sl. Organic Like Odor
09:50	35.03	450	4	16	7.3	802	NM	0.23	4.1	69.44	NM	Clear, Sl. Organic Like Odor
09:55	35.03	450	4.5	16	7.29	802	NM	0.23	3.9	67.1	NM	Clear, Sl. Organic Like Odor
10:00	35.03	450	5	16	7.3	802	NM	0.23	4.3	65.5	NM	Clear, Sl. Organic Like Odor

Sample ID(s): APW-06D-WG-20230920	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 18:01

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-07
Well Permit No:

Date: 2023/09/19
75 deg F Sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.17 (ft)	**Reference Elevation** 360.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.12 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.17 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 403.6 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 16.63 (gal) / 3 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
13:16	32.12	425	0	20.1	6.93	1029	NM	5.49	206.7	61.8	NM	Cloudy, no odor
13:21	32.12	400	0.5	17.9	6.7	1155	NM	0.38	170.8	109	NM	Cloudy, no odor
13:26	32.12	400	1	17.8	6.74	1158	NM	0.27	139.9	76	NM	Cloudy, no odor
13:31	32.12	400	1.5	17.4	6.77	1165	NM	0.18	115.4	68.8	NM	Cloudy, no odor
13:36	32.12	400	2	17.3	6.78	1167	NM	0.13	98	45.2	NM	Clear, no odor
13:41	32.12	400	2.5	17.3	6.78	1167	NM	0.13	89.3	43.3	NM	Clear, no odor
13:46	32.12	400	3	17.3	6.78	1166	NM	0.13	91.5	42.9	NM	Clear, no odor

Sample ID(s): APW-07-WG-20230919	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 18:38

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-08
Well Permit No:

Date: 2023/09/19
75 deg F Sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 56.96 (ft)	**Reference Elevation** 362.71 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.08 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 61.96 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 339.6 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 15.46 (gal) / 5.25 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
11:58	33.08	300	0	22.2	6.03	327	NM	4.52	190.4	1000	NM	Turbid Dark Grey, No odor
12:03	33.08	275	0.5	21.7	5.59	344.6	NM	1.6	185.6	1000	NM	Turbid Dark Grey, No odor
12:08	33.08	350	1	20.3	5.32	359.5	NM	2.57	179.4	1000	NM	Turbid Dark Grey, No odor
12:13	33.08	350	1.5	20.6	4.99	355.7	NM	1.99	172.6	638	NM	Turbid Dark Grey, No odor
12:18	33.08	350	1.75	21.2	4.74	354.9	NM	2.67	165.8	451	NM	Turbid Dark Grey, No odor
12:23	33.08	350	2.25	21.5	4.56	348	NM	2.87	155.6	313	NM	Turbid Dark Grey, No odor
12:28	33.08	350	2.75	21.5	4.5	345.4	NM	3.05	144.7	234	NM	Opaque Grey, No odor
12:33	33.08	350	3.25	21.3	4.48	342.1	NM	3.22	135.6	171	NM	Opaque Grey, No odor
12:38	33.08	350	3.75	22	4.47	267.8	NM	3.55	126.6	129	NM	Opaque Grey, No odor
12:43	33.08	350	4.25	19.6	6.89	660	NM	0.16	146.1	137	NM	Opaque Grey, No odor
12:48	33.08	350	4.75	19.6	6.89	656	NM	0.16	140.2	135	NM	Opaque Grey, No odor
12:53	33.08	350	5.25	19.5	6.91	653	NM	0.16	137.5	141	NM	Cloudy, No odor

Sample ID(s): APW-08-WG-20230919	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 19:02

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-09 Well Permit No:	Date: 2023/09/20 75 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.15 (ft)	**Reference Elevation** 366.84 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 37.04 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.15 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 500 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 13.98 (gal) / 3.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
13:19	37.04	500	0	18.1	7.23	553	NM	4.76	101.3	207	NM	Turbid Lt Brown, No odor
13:24	37.04	500	0.5	16.5	7.3	551	NM	3.18	94.1	108	NM	Cloudy, No odor
13:29	37.04	500	1	16.4	7.36	556	NM	1.79	88.5	39.3	NM	Clear, No odor
13:34	37.04	500	1.5	16.2	7.36	558	NM	0.78	83.2	18	NM	Clear, No odor
13:39	37.04	500	2	16.3	7.4	559	NM	0.52	78.6	13.3	NM	Clear, No odor
13:44	37.04	500	2.5	16.3	7.38	559	NM	0.46	76.1	6.94	NM	Clear, No odor
13:49	37.04	500	3	16.3	7.38	559	NM	0.45	74.7	5.81	NM	Clear, No odor
13:54	37.04	500	3.5	16.3	7.38	558	NM	0.45	73.3	5.64	NM	Clear, No odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-09-WG-20230920,DUP-02-WG-20230920		Clay Sansoucie 	09/22/2023 19:27
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10D
Well Permit No:

Date: 2023/09/19
78 deg F Sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 93.08 (ft)	**Reference Elevation** 359.41 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 29.5 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 98.08 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 395 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 86 - 96 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 36.72 (gal) / 4.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
15:09	29.5	200	0	19.2	7.37	695	NM	2.86	41	42.8	NM	Clear, no odor
15:14	29.5	350	0.5	17.3	6.96	691	NM	0.96	57.8	1000	NM	Turbid Grey, No odor
15:19	29.5	250	1	17.5	7	689	NM	0.89	58.2	1000	NM	Turbid Grey, No odor
15:24	29.5	450	1.5	16.6	7	688	NM	0.65	59.8	721	NM	Turbid Grey, No odor
15:29	29.5	450	2	16.4	7.01	687	NM	0.49	59.1	389	NM	Turbid Grey, No odor
15:34	29.5	450	2.5	16.3	7	686	NM	0.36	58.2	277	NM	Turbid Grey, No odor
15:39	29.5	450	3	16.5	7.01	686	NM	0.3	57.3	199	NM	Turbid Grey, No odor
15:44	29.5	450	3.5	16.6	7.01	686	NM	0.24	56.1	171	NM	Cloudy, No odor
15:49	29.5	450	4	16.6	7	686	NM	0.24	55.6	175	NM	Cloudy, No odor
15:54	29.5	450	4.5	16.4	7	686	NM	0.24	55.7	169	NM	Cloudy, No odor

Sample ID(s): APW-10D-WG-20230919	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 19:46

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10S
Well Permit No:

Date: 2023/09/19
78 deg F Sunny

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 56.75 (ft)	**Reference Elevation** 359.47 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 31.1 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 62.75 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 356.3 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 16.95 (gal) / 3.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
14:13	31.34	400	0	19.4	6.85	1283	NM	2.24	166.9	1000	NM	Turbid Grey, Sl. Rotten Egg Like Odor
14:18	31.3	350	0.5	17.1	6.96	1273	NM	0.19	127.4	1000	NM	Turbid Grey, Sl. Rotten Egg Like Odor
14:23	31.3	350	1	17.4	7	1274	NM	0.14	81	595	NM	Turbid Grey, Sl. Rotten Egg Like Odor
14:28	31.3	350	1.5	17	7	1273	NM	0.11	52.7	250	NM	Turbid Grey, Sl. Rotten Egg Like Odor
14:33	31.3	350	2	17.1	7	1275	NM	0.09	26.3	114	NM	Cloudy, Sl. Rotten Egg Like Odor
14:38	31.3	350	2.5	17.4	7	1274	NM	0.07	10.5	68.5	NM	Cloudy, Sl. Rotten Egg Like Odor
14:43	31.3	350	3	17	6.99	1275	NM	0.07	9.7	65.7	NM	Clear, Sl. Rotten Egg Like Odor
14:48	31.3	350	3.5	17	6.99	1274	NM	0.07	7.4	63.6	NM	Clear, Sl. Rotten Egg Like Odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-10S-WG-20230919		Clay Sansoucie 	09/22/2023 20:03
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06S
Well Permit No:

Date: 2023/09/20
60 deg F Cloudy

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.8 (ft)	**Reference Elevation** 363.51 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 35.32 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.8 (ft)
Project Name 20230906-GWMonitor	**Average Purge Rate** 375 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Clay Sansoucie/ Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 15.25 (gal) / 4.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (uS/cm) ±3%	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(ppm) ±10%	Comments
08:02	35.4	375	0	15.7	7.34	838	NM	3	164.9	391	NM	Turbid Grey, No odor
08:07	35.4	375	0.5	15.7	7.23	886	NM	0.43	151.8	333	NM	Turbid Grey, Organic like odor
08:12	35.4	375	1	15.9	7.2	889	NM	0.31	126.6	175	NM	Turbid Grey, Organic like odor
08:17	35.4	375	1.5	16	7.2	889	NM	0.25	101.9	73.3	NM	Cloudy, Organic like odor
08:22	35.4	375	2	16.1	7.19	890	NM	0.22	78.9	38.2	NM	Clear, Organic like odor
08:27	35.4	375	2.5	16.1	7.19	891	NM	0.18	57	22.9	NM	Clear, Organic like odor
08:32	35.4	375	3	16.1	7.19	890	NM	0.15	41.1	16.2	NM	Clear, Organic like odor
08:37	35.4	375	3.5	16.2	7.2	890	NM	0.14	24.4	9.04	NM	Clear, Organic like odor
08:42	35.4	375	4	16.2	7.2	890	NM	0.14	23.8	9.78	NM	Clear, Organic like odor
08:47	35.4	375	4.5	16.2	7.2	890	NM	0.14	21.7	8.99	NM	Clear, Organic like odor

Sample ID(s): APW-06S-WG-20230920	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Clay Sansoucie 	09/22/2023 18:24

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-01R
Well Permit No:

Date: 2023/11/29
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.37 (ft)	**Reference Elevation** 366.82 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 36.55 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 58.37 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 250 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 48.3 - 58.3 ()
Sampler marshall arendell and nolan legg	**Volume of Water in Well / Total Volume Purged** 3.56 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
09:00	36.55	250	0	10.7	6.45	442	NM	2.25	90.4	631	NM	TURBID, NO ODOR
09:05	36.55	250	0.5	12.3	6.1	458	NM	1.9	90.9	874	NM	TURBID, NO ODOR
09:10	36.55	250	0.75	13.2	6.07	473	NM	1.75	90.6	528	NM	TURBID, NO ODOR
09:15	36.55	250	1	13.8	6.08	484	NM	1.54	90.9	332	NM	TURBID, NO ODOR
09:20	36.55	250	1.25	14	6.1	492	NM	1.49	91.3	246	NM	TURBID, NO ODOR
09:25	36.55	250	1.5	14.3	6.11	500	NM	1.43	91.6	188	NM	TURBID, NO ODOR
09:30	36.55	250	1.75	14.1	6.13	507	NM	1.43	92.2	151	NM	TURBID, NO ODOR
09:35	36.55	250	2	14.5	6.16	516	NM	1.37	92.7	117	NM	TURBID, NO ODOR
09:40	36.55	250	2.25	14.7	6.17	518	NM	1.36	92.8	104	NM	TURBID, NO ODOR
09:45	36.55	250	2.5	14.8	6.18	524	NM	1.32	92.8	95	NM	TURBID, NO ODOR
09:50	36.55	250	2.75	15.1	6.19	528	NM	1.29	93.3	97.3	NM	TURBID, NO ODOR
09:55	36.55	250	3	15.2	6.2	530	NM	1.28	93.5	95.6	NM	TURBID, NO ODOR

Sample ID(s): APW-01R-WG-20231129	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	11/30/2023 22:09

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-02
Well Permit No:

Date: 2023/11/28
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 54.05 (ft)	**Reference Elevation** 364.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.7 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 59.05 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 300 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 47.2 - 57.2 ()
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 4.14 (gal) / 2 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
12:45	36.05	300	0	13	6.95	1057	NM	3.51	42.3	226	NM	TURBID, NO ODOR
12:50	37.76	300	0.5	14.2	6.86	1060	NM	1.87	53	564	NM	TURBID, NO ODOR
12:55	39.75	300	1	14.7	6.86	1060	NM	1.7	53.3	198	NM	TURBID, NO ODOR
13:00	40.71	300	1.25	14.5	6.87	1068	NM	1.53	53.5	178	NM	TURBID, NO ODOR
13:05	41.72	300	1.5	14.2	6.89	1066	NM	1.31	53	183	NM	TURBID, NO ODOR
13:10	42.43	300	1.75	14.2	6.9	1067	NM	1.3	52.1	173	NM	TURBID, NO ODOR
13:15	43.55	300	2	14	6.9	1066	NM	1.28	51.3	169	NM	TURBID, NO ODOR

Sample ID(s): APW-02-WG-20231128	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	12/14/2023 22:07

Low Flow Groundwater Sampling Field Data Form

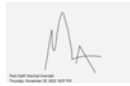
Well ID: APW-03
Well Permit No:

Date: 2023/11/27
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.15 (ft)	**Reference Elevation** 365.79 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 35.55 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 60.15 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 337.5 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 ()
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 4.01 (gal) / 3.25 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
13:30	35.55	250	0	12.8	6.83	861	NM	1.21	110.8	156	NM	CLOUDY, NO ODOR
13:35	35.55	350	0.25	13	6.84	840	NM	0.64	113.3	119	NM	CLOUDY, NO ODOR
13:40	35.55	350	0.75	13.4	6.85	835	NM	0.37	113.9	78.7	NM	CLOUDY, NO ODOR
13:45	35.55	350	1.25	13.4	6.88	820	NM	0.28	112.3	49.5	NM	CLOUDY, NO ODOR
13:50	35.55	350	1.75	13.2	6.89	819	NM	0.24	111.4	22.2	NM	CLEAR, NO ODOR
13:55	35.55	350	2.25	13.5	6.9	814	NM	0.19	109.2	9.79	NM	CLEAR, NO ODOR
14:00	35.55	350	2.75	13.5	6.9	814	NM	0.18	108.6	7.6	NM	CLEAR, NO ODOR
14:05	35.55	350	3.25	13.5	6.9	814	NM	0.16	107	4	NM	CLEAR, NO ODOR

Sample ID(s): APW-03-WG-20231127	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	11/30/2023 22:07

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-04
Well Permit No:

Date: 2023/11/29
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.45 (ft)	**Reference Elevation** 367.44 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 37.45 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 60.45 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 328.6 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 ()
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 3.7 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
07:55	37.45	500	0	13	7.49	614	NM	1.97	89	115	NM	CLOUDY, NO ODOR
08:00	37.45	300	0.5	14	7.21	633	NM	0.51	84.1	150	NM	CLOUDY, NO ODOR
08:05	37.45	300	1	13.6	7.16	638	NM	0.39	79.2	77.6	NM	CLOUDY, NO ODOR
08:10	37.45	300	1.5	13.4	7.14	642	NM	0.3	75.8	33.3	NM	CLOUDY, NO ODOR
08:15	37.45	300	2	13.9	7.13	637	NM	0.32	73.8	22	NM	CLOUDY, NO ODOR
08:20	37.45	300	2.5	14.2	7.12	636	NM	0.32	72.2	21.5	NM	CLOUDY, NO ODOR
08:25	37.45	300	3	14.3	7.11	635	NM	0.31	71	22.8	NM	CLOUDY, NO ODOR

Sample ID(s): APW-04-WG-20231130	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	12/14/2023 22:08

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-05R Well Permit No:	Date: 2023/11/28 sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.7 (ft)	**Reference Elevation** ()
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 34.71 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.7 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 300 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / - ()
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 4.73 (gal) / 3.25 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
11:05	34.75	300	0	11.7	7.23	879	NM	2.8	60.1	85.1	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
11:10	34.75	300	0.5	13.9	7.1	915	NM	1.75	57.1	901	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:15	34.75	300	1	14.2	7.1	916	NM	1.45	53.9	597	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:20	34.75	300	1.25	14.6	7.1	919	NM	1.06	47.3	414	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:25	34.75	300	1.5	14.9	7.11	921	NM	0.75	38.8	268	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:30	34.75	300	1.75	15	7.11	921	NM	0.65	31.8	199	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:35	34.75	300	2	15.2	7.11	921	NM	0.53	24.5	152	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:40	34.75	300	2.25	15.1	7.12	921	NM	0.43	14.3	134	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:45	34.75	300	2.5	15.1	7.13	922	NM	0.29	-3.3	98.4	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:50	34.75	300	2.75	15.2	7.13	922	NM	0.26	-7.1	83.8	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
11:55	34.75	300	3	15.2	7.13	920	NM	0.23	-12.5	82.5	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR
12:00	34.75	300	3.25	15.3	7.13	921	NM	0.21	-16.4	76.1	NM	TURBID, SLIGHT ROTTEN-EGG LIKE ODOR

Sample ID(s): APW-05R-WG-20231128,DUP-01-WG-20231128	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
Analysis:		Marshall Arendell 	12/01/2023 18:44

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06D
Well Permit No:

Date: 2023/11/28
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 151.95 (ft)	**Reference Elevation** 363.69 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.76 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 156.95 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 300 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 140 - 150 (ft)
Sampler marshall arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 20.1 (gal) / 4.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
09:45	33.75	300	0	12.7	7.14	769	NM	1.81	36.1	30	NM	CLEAR, NO ODOR
09:50	33.75	250	0.5	12.7	7.09	767	NM	1.02	25.6	250	NM	TURBID, NO ODOR
09:55	33.75	250	1	13.4	7.08	770	NM	0.83	19.8	131	NM	CLOUDY, NO ODOR
10:00	33.75	250	1.5	13.6	7.08	770	NM	0.74	16.9	116	NM	CLOUDY, NO ODOR
10:05	33.75	250	2	13.7	7.08	770	NM	0.58	12.7	73.9	NM	CLOUDY, NO ODOR
10:10	33.75	250	2.5	13.7	7.08	769	NM	0.41	5.5	48.2	NM	CLOUDY, NO ODOR
10:15	33.75	250	3	14	7.08	768	NM	0.38	3.9	19.5	NM	CLEAR, NO ODOR
10:20	33.75	250	3.5	13.8	7.08	769	NM	0.34	2.1	5.85	NM	CLEAR, NO ODOR
10:25	33.75	250	4	13.7	7.08	769	NM	0.3	0.4	4.49	NM	CLEAR, NO ODOR
10:30	33.75	250	4.5	13.9	7.08	769	NM	0.26	-2.7	3.02	NM	CLEAR, NO ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-06D-WG-20231128		Marshall Arendell 	12/14/2023 22:17
Analysis:			

Low Flow Groundwater Sampling Field Data Form

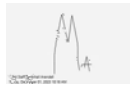
Well ID: APW-07
Well Permit No:

Date: 2023/11/28
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.84 (ft)	**Reference Elevation** 360.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 31 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.84 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 5.36 (gal) / 5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
14:15	31	400	0	12.4	6.62	1148	NM	1.8	64.9	181	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:20	31	400	0.5	12.6	6.6	1166	NM	1.04	59.4	182	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:25	31	400	1	12.9	6.6	1173	NM	0.87	55.1	105	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:30	31	400	1.5	13	6.61	1178	NM	0.57	49.4	78.4	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:35	31	400	2	13	6.61	1179	NM	0.53	45.5	66.9	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:40	31	400	2.5	13	6.61	1181	NM	0.44	42.6	57.3	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:45	31	400	3	13.2	6.62	1182	NM	0.34	38.3	51.2	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:50	31	400	3.5	13.2	6.62	1183	NM	0.31	33.3	43.4	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
14:55	31	400	4	13.3	6.62	1183	NM	0.22	27	23.1	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
15:00	31	400	4.5	13.5	6.62	1183	NM	0.22	24.5	22.6	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR
15:05	31	400	5	13.5	6.62	1181	NM	0.19	21.9	21	NM	CLOUDY, SLIGHTLY ROTTEN-EGG LIKE ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-07-WG-20231128		Marshall Arendell 	12/01/2023 16:16
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-08
Well Permit No:

Date: 2023/11/28
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.5 (ft)	**Reference Elevation** 362.71 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.4 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 62.5 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 4.91 (gal) / 4.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
15:40	32.4	400	0	10.7	7.18	627	NM	2.37	38.9	124	NM	CLOUDY, NO ODOR
15:45	32.4	400	0.5	12.7	6.96	646	NM	1.17	34	1000	NM	OVERRANGE, TURBID, NO ODOR
15:50	32.4	400	1	13.8	6.93	645	NM	0.8	26.5	1000	NM	OVERRANGE, TURBID, NO ODOR
15:55	32.4	400	1.5	13.7	6.92	643	NM	0.62	24.4	680	NM	TURBID, NO ODOR
16:00	32.4	400	2	13.8	6.92	641	NM	0.45	22.6	439	NM	TURBID, NO ODOR
16:05	32.4	400	2.5	13.9	6.92	640	NM	0.39	21.6	326	NM	TURBID, NO ODOR
16:10	32.4	400	3	13.7	6.93	637	NM	0.35	20.1	234	NM	TURBID, NO ODOR
16:15	32.4	400	3.5	13.8	6.93	635	NM	0.28	19	179	NM	TURBID, NO ODOR
16:20	32.4	400	4	13.8	6.94	631	NM	0.24	18.2	162	NM	TURBID, NO ODOR
16:25	32.4	400	4.5	13.8	6.94	629	NM	0.21	17.7	169	NM	TURBID, NO ODOR

Sample ID(s): APW-08-WG-20231128	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	12/01/2023 16:39

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-09
Well Permit No:

Date: 2023/11/29
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.55 (ft)	**Reference Elevation** 366.84 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 36.56 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.55 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 327.8 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler marshall arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 4.4 (gal) / 3 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
10:35	36.6	150	0	14.1	7.44	545	NM	4.77	89.5	44.6	NM	CLOUDY, NO ODOR
10:40	36.6	350	0.5	15	7.22	574	NM	2.6	84.5	71.3	NM	CLOUDY, NO ODOR
10:45	36.6	350	0.75	15	7.2	577	NM	1.37	80.8	49.9	NM	CLOUDY, NO ODOR
10:50	36.6	350	1.25	15.2	7.2	575	NM	1.11	79.2	22.8	NM	CLOUDY, NO ODOR
10:55	36.6	350	1.75	15.3	7.2	574	NM	1.05	78.9	19	NM	CLOUDY, NO ODOR
11:00	36.6	350	2.25	15.2	7.2	573	NM	0.94	78.3	12.2	NM	CLEAR, NO ODOR
11:05	36.6	350	2.5	15.3	7.2	572	NM	0.84	77.9	6.57	NM	CLEAR, NO ODOR
11:10	36.6	350	2.75	15.3	7.2	572	NM	0.83	77.8	4.4	NM	CLEAR, NO ODOR
11:15	36.6	350	3	15.3	7.2	571	NM	0.78	77.7	3.82	NM	CLEAR, NO ODOR

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-09-WG-20231129,DUP-02-WG-20231129		Marshall Arendell 	12/01/2023 18:41
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10D
Well Permit No:

Date: 2023/11/27
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 94.25 (ft)	**Reference Elevation** 359.41 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 29.1 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 99.25 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 355 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 86 - 96 (ft)
Sampler marshall arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 11.45 (gal) / 4.5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
14:40	29.1	450	0	13.2	6.97	668	NM	3.38	113.2	194	NM	CLOUDY, NO ODOR
14:45	29.1	300	0.5	12.4	6.82	665	NM	1.13	111.7	1000	NM	OVERRANGE, TURBID, NO ODOR
14:50	29.1	200	1	12.8	6.83	670	NM	0.59	108.6	1000	NM	OVERRANGE, TURBID, NO ODOR
14:55	29.1	500	1.5	12.7	6.83	667	NM	0.53	107.4	1000	NM	OVERRANGE, TURBID, NO ODOR
15:00	29.1	350	2	13.8	6.83	670	NM	0.43	105.7	801	NM	TURBID, NO ODOR
15:05	29.1	350	2.5	13.7	6.83	671	NM	0.36	104.3	433	NM	TURBID, NO ODOR
15:10	29.1	350	3	13.6	6.83	671	NM	0.34	103.4	300	NM	TURBID, NO ODOR
15:15	29.1	350	3.5	13.5	6.82	670	NM	0.32	102.4	211	NM	TURBID, NO ODOR
15:20	29.1	350	4	13.4	6.82	671	NM	0.3	102.1	203	NM	CLOUDY, NO ODOR
15:25	29.1	350	4.5	13.3	6.82	671	NM	0.28	101.9	196	NM	CLOUDY, NO ODOR

Sample ID(s): APW-10D-WG-20231127	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	12/01/2023 18:56

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-10S Well Permit No:	Date: 2023/11/27 sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.29 (ft)	**Reference Elevation** 359.47 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 30 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 63.29 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 363.6 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler marshall Arendell and Nolan legg	**Volume of Water in Well / Total Volume Purged** 5.43 (gal) / 5 (gal)	**Well Construction** PVC

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
15:40	30.3	400	0	13.4	6.66	1247	NM	1.26	137.7	37.5	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
15:45	30.3	450	0.5	12.9	6.73	1256	NM	0.26	119.2	47.9	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
15:50	30.3	350	1	13.4	6.74	1258	NM	0.17	87.1	41.3	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
15:55	30.3	350	1.5	13.4	6.75	1260	NM	0.14	71.7	33.2	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:00	30.3	350	2	13.4	6.74	1259	NM	0.11	43.9	21.4	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:05	30.3	350	2.5	13.6	6.74	1261	NM	0.1	27.7	22.3	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:10	30.3	350	3	13.7	6.74	1261	NM	0.09	9.4	24.8	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:15	30.3	350	3.5	13.6	6.74	1261	NM	0.09	-5.6	21.7	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:20	30.3	350	4	13.4	6.74	1262	NM	0.08	-19.2	13.5	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:25	30.3	350	4.5	13.3	6.74	1261	NM	0.07	-23.9	14	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR
16:30	30.3	350	5	13.2	6.74	1261	NM	0.07	-26.2	13.1	NM	CLEAR, SLIGHT ROTTEN-EGG LIKE ODOR

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-10S-WG-20231127		Marshall Arendell 	12/01/2023 19:14
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06S
Well Permit No:

Date: 2023/11/28
sunny, cold

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 59.95 (ft)	**Reference Elevation** 363.51 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.95 (ft) / None
Project Number 0599247	**Sample Equipment** NA	**Total Well Depth** 64.98 (ft)
Project Name 20231130-GWMonitor	**Average Purge Rate** 250 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler marshall Arendell and Nolan Legg	**Volume of Water in Well / Total Volume Purged** 5.06 (gal) / 5.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
08:00	34.3	250	0	13.9	7.17	889	NM	0.57	72.6	83.3	NM	CLEAR, NO ODOR
08:05	34.3	250	0.5	12.5	7.12	880	NM	0.35	56.3	16	NM	CLEAR, NO ODOR
08:10	34.3	250	1	13	7.09	879	NM	0.24	33.8	8.06	NM	CLEAR, NO ODOR
08:15	34.3	250	1.5	13	7.1	880	NM	0.2	22.7	5.63	NM	CLEAR, NO ODOR
08:20	34.3	250	2	13.3	7.1	882	NM	0.17	10.5	4.51	NM	CLEAR, NO ODOR
08:25	34.3	250	2.5	13.2	7.1	882	NM	0.15	1.5	2.6	NM	CLEAR, NO ODOR
08:30	34.3	250	3	13.5	7.1	880	NM	0.14	-5.5	1.35	NM	CLEAR, NO ODOR
08:35	34.3	250	3.5	13.1	7.09	880	NM	0.12	-17	2.26	NM	CLEAR, NO ODOR
08:40	34.3	250	4	13.1	7.09	882	NM	0.12	-24.6	1.57	NM	CLEAR, NO ODOR
08:45	34.3	250	4.5	13	7.09	881	NM	0.11	-37.3	2.49	NM	CLEAR, NO ODOR
08:50	34.3	250	5	13.1	7.08	880	NM	0.1	-40.7	1.75	NM	CLEAR, NO ODOR
08:55	34.3	250	5.5	13.1	7.08	880	NM	0.09	-44.8	1.26	NM	CLEAR, NO ODOR

Sample ID(s): APW-06S-WG-20231128	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	12/14/2023 22:13

APPENDIX D LABORATORY ANALYTICAL

February 28, 2023

Matt Halley
ERM
1968 Craig Road
Suite 100
St. Louis, MO 63146
TEL: (314) 952-2760
FAX:

Illinois	100226
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: GTEC **WorkOrder:** 23020169

Dear Matt Halley:

TEKLAB, INC received 15 samples on 2/3/2023 8:45:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

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

Sincerely,

Elizabeth A. Hurley

Elizabeth A. Hurley
Director of Customer Service
(618)344-1004 ex 33
ehurley@teklabinc.com

Report Contents

Client: ERM
Client Project: GTEC

Work Order: 23020169
Report Date: 28-Feb-23

This reporting package includes the following:

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Abbr	Definition
*	Analytes on report marked with an asterisk are not NELAP accredited
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
CRQL	A Client Requested Quantitation Limit is a reporting limit that varies according to customer request. The CRQL may not be less than the MDL.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilution factors.
DNI	Did not ignite
DUP	Laboratory duplicate is a replicate aliquot prepared under the same laboratory conditions and independently analyzed to obtain a measure of precision.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample is a sample matrix, free from the analytes of interest,spiked with verified known amounts of analytes and analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MBLK	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	"The method detection limit is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results."
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
NC	Data is not acceptable for compliance purposes
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions.
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TIC	Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
TNTC	Too numerous to count (> 200 CFU)

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Qualifiers

- Unknown hydrocarbon

B - Analyte detected in associated Method Blank

C - RL shown is a Client Requested Quantitation Limit

E - Value above quantitation range

H - Holding times exceeded

I - Associated internal standard was outside method criteria

J - Analyte detected below quantitation limits

M - Manual Integration used to determine area response

ND - Not Detected at the Reporting Limit

R - RPD outside accepted recovery limits

S - Spike Recovery outside recovery limits

T - TIC(Tentatively identified compound)

X - Value exceeds Maximum Contaminant Level

Case Narrative

http://www.teklabinc.com/

Client: ERM
Client Project: GTEC

Work Order: 23020169
Report Date: 28-Feb-23

Cooler Receipt Temp: 1.6 °C

Radium-226 and Radium-228 analysis was performed by Pace Analytical Services, LLC. See attached report for

Locations

Collinsville

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email jhriley@teklabinc.com

Springfield

Address 3920 Pintail Dr
Springfield, IL 62711-9415
Phone (217) 698-1004
Fax (217) 698-1005
Email KKlostermann@teklabinc.com

Kansas City

Address 8421 Nieman Road
Lenexa, KS 66214
Phone (913) 541-1998
Fax (913) 541-1998
Email jhriley@teklabinc.com

Collinsville Air

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email EHurley@teklabinc.com

Chicago

Address 1319 Butterfield Rd.
Downers Grove, IL 60515
Phone (630) 324-6855
Fax
Email arenner@teklabinc.com

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2024	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2023	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2023	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2023	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2023	Collinsville
Arkansas	ADEQ	88-0966		3/14/2023	Collinsville
Illinois	IDPH	17584		5/31/2023	Collinsville
Iowa	IDNR	430		6/1/2024	Collinsville
Kentucky	UST	0073		1/31/2024	Collinsville
Missouri	MDNR	00930		5/31/2023	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-001 **Client Sample ID:** APW-03-WG-20230130

Matrix: GROUNDWATER **Collection Date:** 01/30/2023 13:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**524**	mg/L	1	02/03/2023 12:55	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**322**	mg/L	10	02/10/2023 12:31	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.45**		1	02/08/2023 16:00	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.23**	mg/L	1	02/09/2023 15:22	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**21**	mg/L	1	02/10/2023 12:26	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 20:48	202752
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	02/10/2023 20:48	202752
Barium	NELAP	0.0010		**0.139**	mg/L	5	02/10/2023 20:48	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 20:48	202752
Boron	NELAP	0.0250		**4.98**	mg/L	5	02/10/2023 20:48	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 20:48	202752
Calcium	NELAP	0.125		**121**	mg/L	5	02/15/2023 8:33	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 12:51	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 12:51	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 20:48	202752
Lithium	*	0.0030		**0.0275**	mg/L	5	02/10/2023 20:48	202752
Molybdenum	NELAP	0.0015		**0.0521**	mg/L	5	02/13/2023 13:28	202752
Nickel	NELAP	0.0010		**0.0011**	mg/L	5	02/14/2023 12:51	202752
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 20:48	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 20:48	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/09/2023 18:08	202662
Arsenic	NELAP	0.0010		**0.0030**	mg/L	5	02/13/2023 23:02	202807
Barium	NELAP	0.0010		**0.135**	mg/L	5	02/09/2023 18:08	202662
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/09/2023 18:08	202662
Boron	NELAP	0.0250		**4.94**	mg/L	5	02/09/2023 18:08	202662
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/09/2023 18:08	202662
Calcium	NELAP	0.125		**111**	mg/L	5	02/10/2023 11:50	202662
Chromium	NELAP	0.0015		**0.0019**	mg/L	5	02/10/2023 11:50	202662
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/09/2023 18:08	202662
Iron	NELAP	0.0250		**2.41**	mg/L	5	02/09/2023 18:08	202662
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/09/2023 18:08	202662
Lithium	*	0.0030		**0.0276**	mg/L	5	02/09/2023 18:08	202662
Manganese	NELAP	0.0020		**0.352**	mg/L	5	02/09/2023 18:08	202662
Molybdenum	NELAP	0.0015		**0.0528**	mg/L	5	02/09/2023 18:08	202662
Nickel	NELAP	0.0010		**0.0028**	mg/L	5	02/09/2023 18:08	202662
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/09/2023 18:08	202662
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/09/2023 18:08	202662
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/07/2023 19:54	202649

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-001 **Client Sample ID:** APW-03-WG-20230130

Matrix: GROUNDWATER **Collection Date:** 01/30/2023 13:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-002 **Client Sample ID:** APW-07-WG-20230130

Matrix: GROUNDWATER **Collection Date:** 01/30/2023 14:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**824**	mg/L	1	02/06/2023 12:21	R324475
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**48**	mg/L	1	02/10/2023 12:34	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.23**		1	02/08/2023 16:02	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.19**	mg/L	1	02/07/2023 12:35	R324472
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**14**	mg/L	1	02/10/2023 12:34	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**0.0015**	mg/L	5	02/10/2023 21:39	202752
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:39	202752
Barium	NELAP	0.0010		**0.411**	mg/L	5	02/10/2023 21:39	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:39	202752
Boron	NELAP	0.0250		**0.267**	mg/L	5	02/10/2023 21:39	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:39	202752
Calcium	NELAP	0.125		**199**	mg/L	5	02/15/2023 8:37	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 12:56	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 12:56	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:39	202752
Lithium	*	0.0030		**0.0191**	mg/L	5	02/10/2023 21:39	202752
Molybdenum	NELAP	0.0015		**0.0027**	mg/L	5	02/13/2023 13:34	202752
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 12:56	202752
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:39	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 21:39	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:26	202915
Arsenic	NELAP	0.0010		**0.0014**	mg/L	5	02/16/2023 11:26	202915
Barium	NELAP	0.0010		**0.371**	mg/L	5	02/16/2023 11:26	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:26	202915
Boron	NELAP	0.0250		**0.246**	mg/L	5	02/16/2023 11:26	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:26	202915
Calcium	NELAP	0.125		**200**	mg/L	5	02/16/2023 11:26	202915
Chromium	NELAP	0.0015		**0.0034**	mg/L	5	02/16/2023 11:26	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:26	202915
Iron	NELAP	0.125		**24.4**	mg/L	25	02/20/2023 9:42	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:26	202915
Lithium	*	0.0030		**0.0181**	mg/L	5	02/16/2023 11:26	202915
Manganese	NELAP	0.0020		**1.19**	mg/L	5	02/16/2023 11:26	202915
Molybdenum	NELAP	0.0015		**0.0031**	mg/L	5	02/16/2023 11:26	202915
Nickel	NELAP	0.0010		**0.0021**	mg/L	5	02/16/2023 11:26	202915
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:26	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 11:26	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/07/2023 19:56	202649

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-002
Client Sample ID: APW-07-WG-20230130
Matrix: GROUNDWATER
Collection Date: 01/30/2023 14:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-003 **Client Sample ID:** APW-06S-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 9:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**638**	mg/L	1	02/03/2023 14:50	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**247**	mg/L	10	02/10/2023 12:55	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.12**		1	02/08/2023 16:03	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.29**	mg/L	1	02/09/2023 15:31	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**24**	mg/L	1	02/10/2023 12:45	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:45	202752
Arsenic	NELAP	0.0010		**0.0013**	mg/L	5	02/10/2023 21:45	202752
Barium	NELAP	0.0010		**0.219**	mg/L	5	02/10/2023 21:45	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:45	202752
Boron	NELAP	0.0250		**7.12**	mg/L	5	02/10/2023 21:45	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:45	202752
Calcium	NELAP	0.125		**94.1**	mg/L	5	02/15/2023 8:42	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 13:01	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:01	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:45	202752
Lithium	*	0.0030		**0.0406**	mg/L	5	02/10/2023 21:45	202752
Molybdenum	NELAP	0.0015		**0.244**	mg/L	5	02/13/2023 13:41	202752
Nickel	NELAP	0.0010		**0.0051**	mg/L	5	02/14/2023 13:01	202752
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:45	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 21:45	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:52	202915
Arsenic	NELAP	0.0010		**0.0011**	mg/L	5	02/16/2023 11:52	202915
Barium	NELAP	0.0010		**0.202**	mg/L	5	02/16/2023 11:52	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:52	202915
Boron	NELAP	0.0250	S	**6.84**	mg/L	5	02/16/2023 11:52	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:52	202915
Calcium	NELAP	0.125	S	**97.1**	mg/L	5	02/16/2023 11:52	202915
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 11:52	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:52	202915
Iron	NELAP	0.0250		**9.07**	mg/L	5	02/16/2023 11:52	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:52	202915
Lithium	*	0.0030		**0.0406**	mg/L	5	02/16/2023 11:52	202915
Manganese	NELAP	0.0020		**0.506**	mg/L	5	02/16/2023 11:52	202915
Molybdenum	NELAP	0.0015		**0.265**	mg/L	5	02/16/2023 11:52	202915
Nickel	NELAP	0.0010		**0.0014**	mg/L	5	02/16/2023 11:52	202915
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:52	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 11:52	202915
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/07/2023 20:03	202649

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-003
Client Sample ID: APW-06S-WG-20230201
Matrix: GROUNDWATER
Collection Date: 02/01/2023 9:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-004 **Client Sample ID:** APW-06D-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 11:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**582**	mg/L	1	02/03/2023 14:50	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**269**	mg/L	10	02/10/2023 13:25	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.29**		1	02/08/2023 16:07	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.21**	mg/L	1	02/09/2023 15:33	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**16**	mg/L	1	02/10/2023 13:19	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:51	202752
Arsenic	NELAP	0.0010		**0.0120**	mg/L	5	02/10/2023 21:51	202752
Barium	NELAP	0.0010		**0.152**	mg/L	5	02/10/2023 21:51	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:51	202752
Boron	NELAP	0.0250		**4.39**	mg/L	5	02/10/2023 21:51	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:51	202752
Calcium	NELAP	0.125		**109**	mg/L	5	02/15/2023 8:47	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 13:06	202752
Cobalt	NELAP	0.0010		**0.0010**	mg/L	5	02/14/2023 13:06	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:51	202752
Lithium	*	0.0030		**0.0194**	mg/L	5	02/10/2023 21:51	202752
Molybdenum	NELAP	0.0015		**0.0583**	mg/L	5	02/13/2023 13:47	202752
Nickel	NELAP	0.0010		**0.0063**	mg/L	5	02/14/2023 13:06	202752
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:51	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 21:51	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:32	202915
Arsenic	NELAP	0.0010		**0.0107**	mg/L	5	02/16/2023 11:32	202915
Barium	NELAP	0.0010		**0.134**	mg/L	5	02/16/2023 11:32	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:32	202915
Boron	NELAP	0.0250		**3.95**	mg/L	5	02/16/2023 11:32	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:32	202915
Calcium	NELAP	0.125		**116**	mg/L	5	02/16/2023 11:32	202915
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 11:32	202915
Cobalt	NELAP	0.0010		**0.0013**	mg/L	5	02/16/2023 11:32	202915
Iron	NELAP	0.0250		**3.92**	mg/L	5	02/16/2023 11:32	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:32	202915
Lithium	*	0.0030		**0.0172**	mg/L	5	02/16/2023 11:32	202915
Manganese	NELAP	0.0020		**0.690**	mg/L	5	02/16/2023 11:32	202915
Molybdenum	NELAP	0.0015		**0.0683**	mg/L	5	02/16/2023 11:32	202915
Nickel	NELAP	0.0010		**0.0030**	mg/L	5	02/16/2023 11:32	202915
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:32	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 11:32	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:12	202742

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-004 **Client Sample ID:** APW-06D-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 11:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-005 **Client Sample ID:** APW-05-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 12:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**696**	mg/L	1	02/03/2023 14:50	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**325**	mg/L	10	02/10/2023 13:33	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.31**		1	02/08/2023 16:12	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.33**	mg/L	1	02/09/2023 15:35	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**18**	mg/L	1	02/10/2023 13:27	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:10	202752
Arsenic	NELAP	0.0010		**0.0026**	mg/L	5	02/10/2023 22:10	202752
Barium	NELAP	0.0010		**0.175**	mg/L	5	02/10/2023 22:10	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:10	202752
Boron	NELAP	0.0250	S	**8.68**	mg/L	5	02/10/2023 22:10	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:10	202752
Calcium	NELAP	0.125	S	**106**	mg/L	5	02/15/2023 18:31	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 13:26	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:26	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:10	202752
Lithium	*	0.0030		**0.0450**	mg/L	5	02/10/2023 22:10	202752
Molybdenum	NELAP	0.0015		**0.187**	mg/L	5	02/13/2023 13:53	202752
Nickel	NELAP	0.0010		**0.0017**	mg/L	5	02/14/2023 13:26	202752
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:10	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 22:10	202752
Matrix spike control limits for Ca are not applicable due to high sample/spike ratio.								
Matrix spike control limits for B are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:39	202915
Arsenic	NELAP	0.0010		**0.0024**	mg/L	5	02/16/2023 11:39	202915
Barium	NELAP	0.0010		**0.145**	mg/L	5	02/16/2023 11:39	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:39	202915
Boron	NELAP	0.0250		**7.35**	mg/L	5	02/16/2023 11:39	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:39	202915
Calcium	NELAP	0.125		**112**	mg/L	5	02/16/2023 11:39	202915
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 11:39	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:39	202915
Iron	NELAP	0.0250		**1.65**	mg/L	5	02/16/2023 11:39	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:39	202915
Lithium	*	0.0030		**0.0399**	mg/L	5	02/16/2023 11:39	202915
Manganese	NELAP	0.0020		**0.706**	mg/L	5	02/16/2023 11:39	202915
Molybdenum	NELAP	0.0015		**0.217**	mg/L	5	02/16/2023 11:39	202915
Nickel	NELAP	0.0010		**0.0022**	mg/L	5	02/16/2023 11:39	202915
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:39	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 11:39	202915

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-005 **Client Sample ID:** APW-05-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 12:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:14	202742
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-006 **Client Sample ID:** APW-02-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**852**	mg/L	1	02/03/2023 14:51	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**459**	mg/L	10	02/10/2023 13:40	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**6.98**		1	02/08/2023 16:16	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.23**	mg/L	1	02/09/2023 15:37	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**10**	mg/L	1	02/10/2023 13:35	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:57	202752
Arsenic	NELAP	0.0010		**0.0160**	mg/L	5	02/10/2023 21:57	202752
Barium	NELAP	0.0010		**0.187**	mg/L	5	02/10/2023 21:57	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:57	202752
Boron	NELAP	0.0250		**8.21**	mg/L	5	02/10/2023 21:57	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:57	202752
Calcium	NELAP	0.125		**108**	mg/L	5	02/15/2023 8:52	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 13:11	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:11	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:57	202752
Lithium	*	0.0030		**0.0425**	mg/L	5	02/10/2023 21:57	202752
Molybdenum	NELAP	0.0015		**0.151**	mg/L	5	02/13/2023 15:01	202752
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:11	202752
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 21:57	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 21:57	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:45	202915
Arsenic	NELAP	0.0010		**0.0185**	mg/L	5	02/16/2023 11:45	202915
Barium	NELAP	0.0010		**0.214**	mg/L	5	02/16/2023 11:45	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:45	202915
Boron	NELAP	0.0250		**7.75**	mg/L	5	02/16/2023 11:45	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:45	202915
Calcium	NELAP	0.125		**144**	mg/L	5	02/16/2023 11:45	202915
Chromium	NELAP	0.0015		**0.0052**	mg/L	5	02/16/2023 11:45	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:45	202915
Iron	NELAP	0.125		**18.2**	mg/L	25	02/20/2023 9:48	202915
Lead	NELAP	0.0010		**0.0027**	mg/L	5	02/16/2023 11:45	202915
Lithium	*	0.0030		**0.0417**	mg/L	5	02/16/2023 11:45	202915
Manganese	NELAP	0.0020		**0.719**	mg/L	5	02/16/2023 11:45	202915
Molybdenum	NELAP	0.0015		**0.165**	mg/L	5	02/16/2023 11:45	202915
Nickel	NELAP	0.0010		**0.0039**	mg/L	5	02/16/2023 11:45	202915
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 11:45	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 11:45	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:16	202742

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-006
Client Sample ID: APW-02-WG-20230201
Matrix: GROUNDWATER
Collection Date: 02/01/2023 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-007 **Client Sample ID:** APW-09-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 15:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**360**	mg/L	1	02/03/2023 14:51	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**38**	mg/L	1	02/10/2023 13:43	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.72**		1	02/08/2023 16:19	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.19**	mg/L	1	02/09/2023 15:39	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**13**	mg/L	1	02/10/2023 13:43	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:04	202752
Arsenic	NELAP	0.0010		**0.0019**	mg/L	5	02/10/2023 22:04	202752
Barium	NELAP	0.0010		**0.107**	mg/L	5	02/10/2023 22:04	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:04	202752
Boron	NELAP	0.0250		**0.239**	mg/L	5	02/10/2023 22:04	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:04	202752
Calcium	NELAP	0.125		**76.3**	mg/L	5	02/24/2023 10:46	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 13:16	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:16	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:04	202752
Lithium	*	0.0030		**0.0125**	mg/L	5	02/10/2023 22:04	202752
Molybdenum	NELAP	0.0015		**0.0165**	mg/L	5	02/13/2023 15:07	202752
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:16	202752
Selenium	NELAP	0.0010		**0.0179**	mg/L	5	02/10/2023 22:04	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 22:04	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:49	202915
Arsenic	NELAP	0.0010		**0.0024**	mg/L	5	02/16/2023 12:49	202915
Barium	NELAP	0.0010		**0.122**	mg/L	5	02/16/2023 12:49	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:49	202915
Boron	NELAP	0.0250		**0.225**	mg/L	5	02/16/2023 12:49	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:49	202915
Calcium	NELAP	0.125		**80.3**	mg/L	5	02/16/2023 12:49	202915
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 12:49	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:49	202915
Iron	NELAP	0.0250		**0.149**	mg/L	5	02/16/2023 12:49	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:49	202915
Lithium	*	0.0030		**0.0137**	mg/L	5	02/16/2023 12:49	202915
Manganese	NELAP	0.0020		**0.0945**	mg/L	5	02/16/2023 12:49	202915
Molybdenum	NELAP	0.0015		**0.0173**	mg/L	5	02/16/2023 12:49	202915
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:49	202915
Selenium	NELAP	0.0010		**0.0196**	mg/L	5	02/16/2023 12:49	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 12:49	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:19	202742

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-007 **Client Sample ID:** APW-09-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 15:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-008 **Client Sample ID:** APW-08-WG-20230202

Matrix: GROUNDWATER **Collection Date:** 02/02/2023 9:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**378**	mg/L	1	02/07/2023 12:03	R324544
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**29**	mg/L	1	02/10/2023 13:51	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.31**		1	02/08/2023 16:21	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.26**	mg/L	1	02/09/2023 15:41	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**13**	mg/L	1	02/10/2023 13:51	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:54	202752
Arsenic	NELAP	0.0010		**0.0010**	mg/L	5	02/10/2023 22:54	202752
Barium	NELAP	0.0010		**0.150**	mg/L	5	02/10/2023 22:54	202752
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:54	202752
Boron	NELAP	0.0250		**0.0895**	mg/L	5	02/10/2023 22:54	202752
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:54	202752
Calcium	NELAP	0.125		**72.1**	mg/L	5	02/24/2023 11:05	202752
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/14/2023 13:21	202752
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/14/2023 13:21	202752
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 22:54	202752
Lithium	*	0.0030		**0.0131**	mg/L	5	02/10/2023 22:54	202752
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 15:14	202752
Nickel	NELAP	0.0010		**0.0013**	mg/L	5	02/10/2023 22:54	202752
Selenium	NELAP	0.0010		**0.0128**	mg/L	5	02/10/2023 22:54	202752
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 22:54	202752
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:56	202915
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	02/16/2023 12:56	202915
Barium	NELAP	0.0010		**0.167**	mg/L	5	02/16/2023 12:56	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:56	202915
Boron	NELAP	0.0250		**0.0950**	mg/L	5	02/16/2023 12:56	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:56	202915
Calcium	NELAP	0.125		**79.4**	mg/L	5	02/16/2023 12:56	202915
Chromium	NELAP	0.0015		**0.0027**	mg/L	5	02/16/2023 12:56	202915
Cobalt	NELAP	0.0010		**0.0012**	mg/L	5	02/16/2023 12:56	202915
Iron	NELAP	0.0250		**1.26**	mg/L	5	02/16/2023 12:56	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 12:56	202915
Lithium	*	0.0030		**0.0155**	mg/L	5	02/16/2023 12:56	202915
Manganese	NELAP	0.0020		**0.0561**	mg/L	5	02/16/2023 12:56	202915
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 12:56	202915
Nickel	NELAP	0.0010		**0.0030**	mg/L	5	02/16/2023 12:56	202915
Selenium	NELAP	0.0010		**0.0148**	mg/L	5	02/16/2023 12:56	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 12:56	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:21	202742

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-008
Client Sample ID: APW-08-WG-20230202
Matrix: GROUNDWATER
Collection Date: 02/02/2023 9:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-009 **Client Sample ID:** APW-10S-WG-20230202

Matrix: GROUNDWATER **Collection Date:** 02/02/2023 11:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**780**	mg/L	2.5	02/07/2023 12:04	R324544
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	02/10/2023 14:15	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.20**		1	02/08/2023 16:26	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.15**	mg/L	1	02/09/2023 15:43	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**21**	mg/L	1	02/10/2023 14:15	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**0.0016**	mg/L	5	02/13/2023 9:52	202753
Arsenic	NELAP	0.0010		**0.171**	mg/L	5	02/10/2023 15:35	202753
Barium	NELAP	0.0010		**0.506**	mg/L	5	02/10/2023 15:35	202753
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 9:52	202753
Boron	NELAP	0.0250		**0.497**	mg/L	5	02/10/2023 15:35	202753
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 9:52	202753
Calcium	NELAP	0.125		**145**	mg/L	5	02/13/2023 9:52	202753
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 9:52	202753
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 9:52	202753
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:35	202753
Lithium	*	0.0030		**0.0268**	mg/L	5	02/10/2023 15:35	202753
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 9:52	202753
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:35	202753
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:35	202753
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 15:35	202753
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:02	202915
Arsenic	NELAP	0.0010		**0.191**	mg/L	5	02/16/2023 13:02	202915
Barium	NELAP	0.0010		**0.575**	mg/L	5	02/16/2023 13:02	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:02	202915
Boron	NELAP	0.0250		**0.592**	mg/L	5	02/16/2023 13:02	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:02	202915
Calcium	NELAP	0.125		**145**	mg/L	5	02/16/2023 13:02	202915
Chromium	NELAP	0.0015		**0.0023**	mg/L	5	02/16/2023 13:02	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:02	202915
Iron	NELAP	0.125		**23.8**	mg/L	25	02/20/2023 9:55	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:02	202915
Lithium	*	0.0030		**0.0323**	mg/L	5	02/16/2023 13:02	202915
Manganese	NELAP	0.0020		**0.179**	mg/L	5	02/16/2023 13:02	202915
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 13:02	202915
Nickel	NELAP	0.0010		**0.0013**	mg/L	5	02/16/2023 13:02	202915
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:02	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 13:02	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:28	202742

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-009
Client Sample ID: APW-10S-WG-20230202
Matrix: GROUNDWATER
Collection Date: 02/02/2023 11:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-010 **Client Sample ID:** APW-10D-WG-20230202

Matrix: GROUNDWATER **Collection Date:** 02/02/2023 12:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**454**	mg/L	1	02/06/2023 12:49	R324475
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**39**	mg/L	1	02/10/2023 14:23	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.57**		1	02/08/2023 16:27	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.12**	mg/L	1	02/09/2023 15:45	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**13**	mg/L	1	02/10/2023 14:23	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 9:59	202753
Arsenic	NELAP	0.0010		**0.0011**	mg/L	5	02/10/2023 15:41	202753
Barium	NELAP	0.0010		**0.304**	mg/L	5	02/10/2023 15:41	202753
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 9:59	202753
Boron	NELAP	0.0250		**0.0579**	mg/L	5	02/10/2023 15:41	202753
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 9:59	202753
Calcium	NELAP	0.125		**114**	mg/L	5	02/13/2023 9:59	202753
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 9:59	202753
Cobalt	NELAP	0.0010		**0.0030**	mg/L	5	02/13/2023 9:59	202753
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:41	202753
Lithium	*	0.0030		**0.0120**	mg/L	5	02/10/2023 15:41	202753
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 9:59	202753
Nickel	NELAP	0.0010		**0.0051**	mg/L	5	02/10/2023 15:41	202753
Selenium	NELAP	0.0010		**0.0024**	mg/L	5	02/10/2023 15:41	202753
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 15:41	202753
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:08	202915
Arsenic	NELAP	0.0010		**0.0017**	mg/L	5	02/16/2023 13:08	202915
Barium	NELAP	0.0010		**0.343**	mg/L	5	02/16/2023 13:08	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:08	202915
Boron	NELAP	0.0250		**0.0730**	mg/L	5	02/16/2023 13:08	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:08	202915
Calcium	NELAP	0.125		**122**	mg/L	5	02/16/2023 13:08	202915
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 13:08	202915
Cobalt	NELAP	0.0010		**0.0033**	mg/L	5	02/16/2023 13:08	202915
Iron	NELAP	0.0250		**0.480**	mg/L	5	02/16/2023 13:08	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:08	202915
Lithium	*	0.0030		**0.0146**	mg/L	5	02/16/2023 13:08	202915
Manganese	NELAP	0.0020		**0.941**	mg/L	5	02/16/2023 13:08	202915
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 13:08	202915
Nickel	NELAP	0.0010		**0.0066**	mg/L	5	02/16/2023 13:08	202915
Selenium	NELAP	0.0010		**0.0027**	mg/L	5	02/16/2023 13:08	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 13:08	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:34	202742

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-010 **Client Sample ID:** APW-10D-WG-20230202

Matrix: GROUNDWATER **Collection Date:** 02/02/2023 12:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-011 **Client Sample ID:** APW-04-WG-20230202

Matrix: GROUNDWATER **Collection Date:** 02/02/2023 14:05

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**416**	mg/L	1	02/06/2023 12:49	R324475
SW-846 9036 (TOTAL)								
Sulfate	NELAP	20		**62**	mg/L	2	02/13/2023 11:51	R324732
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.21**		1	02/08/2023 16:29	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.15**	mg/L	1	02/09/2023 15:55	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**10**	mg/L	1	02/10/2023 14:31	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:24	202753
Arsenic	NELAP	0.0010		**0.0011**	mg/L	5	02/10/2023 16:06	202753
Barium	NELAP	0.0010		**0.116**	mg/L	5	02/10/2023 16:06	202753
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:24	202753
Boron	NELAP	0.0250		**0.619**	mg/L	5	02/10/2023 16:06	202753
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:24	202753
Calcium	NELAP	0.125	S	**93.3**	mg/L	5	02/13/2023 10:24	202753
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 10:24	202753
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:24	202753
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 16:06	202753
Lithium	*	0.0030		**0.0292**	mg/L	5	02/10/2023 16:06	202753
Molybdenum	NELAP	0.0015		**0.0383**	mg/L	5	02/13/2023 10:24	202753
Nickel	NELAP	0.0010		**0.0021**	mg/L	5	02/10/2023 16:06	202753
Selenium	NELAP	0.0010		**0.0090**	mg/L	5	02/10/2023 16:06	202753
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 16:06	202753
Matrix spike control limits for Ca are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:15	202915
Arsenic	NELAP	0.0010		**0.0017**	mg/L	5	02/16/2023 13:15	202915
Barium	NELAP	0.0010		**0.134**	mg/L	5	02/16/2023 13:15	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:15	202915
Boron	NELAP	0.0250		**0.650**	mg/L	5	02/16/2023 13:15	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:15	202915
Calcium	NELAP	0.125		**100**	mg/L	5	02/16/2023 13:15	202915
Chromium	NELAP	0.0015		**0.0016**	mg/L	5	02/16/2023 13:15	202915
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:15	202915
Iron	NELAP	0.0250		**0.615**	mg/L	5	02/16/2023 13:15	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:15	202915
Lithium	*	0.0030		**0.0326**	mg/L	5	02/16/2023 13:15	202915
Manganese	NELAP	0.0020		**0.187**	mg/L	5	02/16/2023 13:15	202915
Molybdenum	NELAP	0.0015		**0.0377**	mg/L	5	02/16/2023 13:15	202915
Nickel	NELAP	0.0010		**0.0042**	mg/L	5	02/16/2023 13:15	202915
Selenium	NELAP	0.0010		**0.0099**	mg/L	5	02/16/2023 13:15	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 13:15	202915
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 19:37	202742

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-011
Client Sample ID: APW-04-WG-20230202
Matrix: GROUNDWATER
Collection Date: 02/02/2023 14:05

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/10/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-012 **Client Sample ID:** APW-01R-WG-20230202

Matrix: GROUNDWATER **Collection Date:** 02/02/2023 15:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**384**	mg/L	1	02/06/2023 12:49	R324475
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		**74**	mg/L	5	02/13/2023 12:08	R324732
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**6.57**		1	02/08/2023 16:31	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.17**	mg/L	1	02/09/2023 15:58	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**7**	mg/L	1	02/10/2023 14:42	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:05	202753
Arsenic	NELAP	0.0010		**0.0010**	mg/L	5	02/10/2023 15:47	202753
Barium	NELAP	0.0010		**0.155**	mg/L	5	02/10/2023 15:47	202753
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:05	202753
Boron	NELAP	0.0250		**0.205**	mg/L	5	02/10/2023 15:47	202753
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:05	202753
Calcium	NELAP	0.125		**71.4**	mg/L	5	02/13/2023 10:05	202753
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 10:05	202753
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:05	202753
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:47	202753
Lithium	*	0.0030		**0.0135**	mg/L	5	02/10/2023 15:47	202753
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 10:05	202753
Nickel	NELAP	0.0010		**0.0059**	mg/L	5	02/10/2023 15:47	202753
Selenium	NELAP	0.0010		**0.0032**	mg/L	5	02/10/2023 15:47	202753
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 15:47	202753
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:21	202915
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	02/16/2023 13:21	202915
Barium	NELAP	0.0010		**0.178**	mg/L	5	02/16/2023 13:21	202915
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:21	202915
Boron	NELAP	0.0250		**0.221**	mg/L	5	02/16/2023 13:21	202915
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:21	202915
Calcium	NELAP	0.125	S	**75.5**	mg/L	5	02/16/2023 13:21	202915
Chromium	NELAP	0.0015		**0.0022**	mg/L	5	02/16/2023 13:21	202915
Cobalt	NELAP	0.0010		**0.0013**	mg/L	5	02/16/2023 13:21	202915
Iron	NELAP	0.0250		**0.627**	mg/L	5	02/16/2023 13:21	202915
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 13:21	202915
Lithium	*	0.0030		**0.0157**	mg/L	5	02/16/2023 13:21	202915
Manganese	NELAP	0.0020		**0.0964**	mg/L	5	02/16/2023 13:21	202915
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 13:21	202915
Nickel	NELAP	0.0010		**0.0081**	mg/L	5	02/16/2023 13:21	202915
Selenium	NELAP	0.0010		**0.0037**	mg/L	5	02/16/2023 13:21	202915
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 13:21	202915

Matrix spike control limits are not applicable due to high sample/spike ratio.

SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 11:37	202743

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-012
Client Sample ID: APW-01R-WG-20230202
Matrix: GROUNDWATER
Collection Date: 02/02/2023 15:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-013 **Client Sample ID:** EB-01-WQ-20230130

Matrix: AQUEOUS **Collection Date:** 01/30/2023 9:40

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20	H	**< 20**	mg/L	1	02/22/2023 11:44	R325208
Sample required re-analysis out of hold time.								
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	02/10/2023 15:19	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**5.54**		1	02/08/2023 16:37	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**< 0.10**	mg/L	1	02/09/2023 15:59	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**< 1**	mg/L	1	02/10/2023 15:19	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/18/2023 5:39	202963
Boron	NELAP	0.0250	S	**< 0.0250**	mg/L	5	02/20/2023 12:15	202963
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/18/2023 5:39	202963
Calcium	NELAP	0.125		**< 0.125**	mg/L	5	02/16/2023 16:33	202963
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 16:33	202963
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Lithium	*	0.0030		**< 0.0030**	mg/L	5	02/18/2023 5:39	202963
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/18/2023 5:39	202963
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 16:33	202963
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 16:33	202963
Matrix spike recovered outside upper control limits. Sample results are below the reporting limit. Data is reportable.								
LCS recovered outside upper control limits for Sb, As, and Ba. Sample results are below the reporting limit. Data is reportable per the TNI Standard.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/17/2023 9:37	202916
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	02/17/2023 9:37	202916
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/17/2023 9:37	202916
Calcium	NELAP	0.125		**< 0.125**	mg/L	5	02/16/2023 14:25	202916
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 14:25	202916
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Iron	NELAP	0.0250		**< 0.0250**	mg/L	5	02/16/2023 14:25	202916
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Lithium	*	0.0030		**< 0.0030**	mg/L	5	02/17/2023 9:37	202916
Manganese	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 14:25	202916
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	02/17/2023 9:37	202916
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:25	202916
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 14:25	202916

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-013 **Client Sample ID:** EB-01-WQ-20230130

Matrix: AQUEOUS **Collection Date:** 01/30/2023 9:40

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 11:39	202743
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-014 **Client Sample ID:** DUP-01-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 0:01

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**670**	mg/L	1	02/03/2023 14:51	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**305**	mg/L	10	02/10/2023 15:32	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.33**		1	02/08/2023 16:40	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.33**	mg/L	1	02/09/2023 16:02	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**18**	mg/L	1	02/10/2023 15:27	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:11	202753
Arsenic	NELAP	0.0010		**0.0018**	mg/L	5	02/10/2023 15:54	202753
Barium	NELAP	0.0010		**0.135**	mg/L	5	02/10/2023 15:54	202753
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:11	202753
Boron	NELAP	0.0250		**6.76**	mg/L	5	02/10/2023 15:54	202753
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:11	202753
Calcium	NELAP	0.125		**111**	mg/L	5	02/13/2023 10:11	202753
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 10:11	202753
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:11	202753
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:54	202753
Lithium	*	0.0030		**0.0375**	mg/L	5	02/10/2023 15:54	202753
Molybdenum	NELAP	0.0015		**0.199**	mg/L	5	02/13/2023 10:11	202753
Nickel	NELAP	0.0010		**0.0013**	mg/L	5	02/10/2023 15:54	202753
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 15:54	202753
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 15:54	202753
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:31	202916
Arsenic	NELAP	0.0010		**0.0025**	mg/L	5	02/16/2023 14:31	202916
Barium	NELAP	0.0010		**0.148**	mg/L	5	02/16/2023 14:31	202916
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/17/2023 9:43	202916
Boron	NELAP	0.0250		**7.59**	mg/L	5	02/17/2023 9:43	202916
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/17/2023 9:43	202916
Calcium	NELAP	0.125		**114**	mg/L	5	02/16/2023 14:31	202916
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/16/2023 14:31	202916
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:31	202916
Iron	NELAP	0.0250		**1.58**	mg/L	5	02/16/2023 14:31	202916
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:31	202916
Lithium	*	0.0030		**0.0402**	mg/L	5	02/17/2023 9:43	202916
Manganese	NELAP	0.0020		**0.693**	mg/L	5	02/16/2023 14:31	202916
Molybdenum	NELAP	0.0015		**0.212**	mg/L	5	02/17/2023 9:43	202916
Nickel	NELAP	0.0010		**0.0018**	mg/L	5	02/16/2023 14:31	202916
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:31	202916
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 14:31	202916
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 11:50	202743

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-014 **Client Sample ID:** DUP-01-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 0:01

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Lab ID: 23020169-015 **Client Sample ID:** DUP-02-WG-20230201

Matrix: GROUNDWATER **Collection Date:** 02/01/2023 0:02

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**866**	mg/L	1	02/03/2023 14:52	R324399
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**455**	mg/L	10	02/10/2023 15:40	R324668
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.05**		1	02/08/2023 16:42	R324541
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.22**	mg/L	1	02/09/2023 16:04	R324574
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		**10**	mg/L	1	02/10/2023 15:35	R324670
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:17	202753
Arsenic	NELAP	0.0010		**0.0138**	mg/L	5	02/10/2023 16:00	202753
Barium	NELAP	0.0010		**0.154**	mg/L	5	02/10/2023 16:00	202753
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:17	202753
Boron	NELAP	0.0250		**7.39**	mg/L	5	02/10/2023 16:00	202753
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:17	202753
Calcium	NELAP	0.125		**144**	mg/L	5	02/13/2023 10:17	202753
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	02/13/2023 10:17	202753
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/13/2023 10:17	202753
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 16:00	202753
Lithium	*	0.0030		**0.0387**	mg/L	5	02/10/2023 16:00	202753
Molybdenum	NELAP	0.0015		**0.155**	mg/L	5	02/13/2023 10:17	202753
Nickel	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 16:00	202753
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/10/2023 16:00	202753
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/10/2023 16:00	202753
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:57	202916
Arsenic	NELAP	0.0010		**0.0175**	mg/L	5	02/16/2023 14:57	202916
Barium	NELAP	0.0010		**0.159**	mg/L	5	02/16/2023 14:57	202916
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/17/2023 9:50	202916
Boron	NELAP	0.0250	S	**8.32**	mg/L	5	02/17/2023 9:50	202916
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/17/2023 9:50	202916
Calcium	NELAP	0.125	S	**149**	mg/L	5	02/16/2023 14:57	202916
Chromium	NELAP	0.0015		**0.0022**	mg/L	5	02/16/2023 14:57	202916
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:57	202916
Iron	NELAP	0.0250		**11.7**	mg/L	5	02/16/2023 14:57	202916
Lead	NELAP	0.0010		**0.0023**	mg/L	5	02/16/2023 14:57	202916
Lithium	*	0.0030		**0.0440**	mg/L	5	02/17/2023 9:50	202916
Manganese	NELAP	0.0020		**0.712**	mg/L	5	02/16/2023 14:57	202916
Molybdenum	NELAP	0.0015		**0.160**	mg/L	5	02/17/2023 9:50	202916
Nickel	NELAP	0.0010		**0.0023**	mg/L	5	02/16/2023 14:57	202916
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	02/16/2023 14:57	202916
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	02/16/2023 14:57	202916

Matrix spike control limits are not applicable due to high sample/spike ratio.

SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	02/10/2023 11:53	202743

Client: ERM
Work Order: 23020169
Client Project: GTEC
Report Date: 28-Feb-23
Lab ID: 23020169-015
Client Sample ID: DUP-02-WG-20230201
Matrix: GROUNDWATER
Collection Date: 02/01/2023 0:02

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261
Radium-228	*	0		**See Attached**	pci/L	1	02/16/2023 0:00	R325261

Client: ERM
Client Project: GTEC

Work Order: 23020169
Report Date: 28-Feb-23

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
23020169-001	APW-03-WG-20230130	Groundwater	4	01/30/2023 13:30
23020169-002	APW-07-WG-20230130	Groundwater	4	01/30/2023 14:45
23020169-003	APW-06S-WG-20230201	Groundwater	4	02/01/2023 9:10
23020169-004	APW-06D-WG-20230201	Groundwater	4	02/01/2023 11:00
23020169-005	APW-05-WG-20230201	Groundwater	4	02/01/2023 12:25
23020169-006	APW-02-WG-20230201	Groundwater	4	02/01/2023 13:50
23020169-007	APW-09-WG-20230201	Groundwater	4	02/01/2023 15:50
23020169-008	APW-08-WG-20230202	Groundwater	4	02/02/2023 9:45
23020169-009	APW-10S-WG-20230202	Groundwater	4	02/02/2023 11:10
23020169-010	APW-10D-WG-20230202	Groundwater	4	02/02/2023 12:30
23020169-011	APW-04-WG-20230202	Groundwater	4	02/02/2023 14:05
23020169-012	APW-01R-WG-20230202	Groundwater	4	02/02/2023 15:10
23020169-013	EB-01-WQ-20230130	Aqueous	5	01/30/2023 9:40
23020169-014	DUP-01-WG-20230201	Groundwater	4	02/01/2023 0:01
23020169-015	DUP-02-WG-20230201	Groundwater	4	02/01/2023 0:02

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23020169-001A	APW-03-WG-20230130	01/30/2023 13:30	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 12:55
	SW-846 9036 (Total)				02/10/2023 12:31
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:00
	SW-846 9214 (Total)				02/09/2023 15:22
	SW-846 9251 (Total)				02/10/2023 12:26
23020169-001B	APW-03-WG-20230130	01/30/2023 13:30	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-001C	APW-03-WG-20230130	01/30/2023 13:30	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/07/2023 9:43	02/09/2023 18:08
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/07/2023 9:43	02/10/2023 11:50
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/10/2023 14:02	02/13/2023 23:02
	SW-846 7470A (Total)			02/07/2023 8:30	02/07/2023 19:54
23020169-001D	APW-03-WG-20230130	01/30/2023 13:30	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 20:48
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 13:28
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 12:51
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/15/2023 8:33
23020169-002A	APW-07-WG-20230130	01/30/2023 14:45	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/06/2023 12:21
	SW-846 9036 (Total)				02/10/2023 12:34
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:02
	SW-846 9214 (Total)				02/07/2023 12:35
	SW-846 9251 (Total)				02/10/2023 12:34
23020169-002B	APW-07-WG-20230130	01/30/2023 14:45	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-002C	APW-07-WG-20230130	01/30/2023 14:45	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 16:52
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 11:26
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/20/2023 9:42
	SW-846 7470A (Total)			02/07/2023 8:30	02/07/2023 19:56
23020169-002D	APW-07-WG-20230130	01/30/2023 14:45	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 21:39
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 13:34
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 12:56
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/15/2023 8:37

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23020169-003A	APW-06S-WG-20230201	02/01/2023 9:10	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:50
	SW-846 9036 (Total)				02/10/2023 12:55
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:03
	SW-846 9214 (Total)				02/09/2023 15:31
	SW-846 9251 (Total)				02/10/2023 12:45
23020169-003B	APW-06S-WG-20230201	02/01/2023 9:10	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-003C	APW-06S-WG-20230201	02/01/2023 9:10	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 17:23
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 11:52
	SW-846 7470A (Total)			02/07/2023 8:30	02/07/2023 20:03
23020169-003D	APW-06S-WG-20230201	02/01/2023 9:10	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 21:45
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 13:41
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 13:01
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/15/2023 8:42
23020169-004A	APW-06D-WG-20230201	02/01/2023 11:00	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:50
	SW-846 9036 (Total)				02/10/2023 13:25
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:07
	SW-846 9214 (Total)				02/09/2023 15:33
	SW-846 9251 (Total)				02/10/2023 13:19
23020169-004B	APW-06D-WG-20230201	02/01/2023 11:00	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-004C	APW-06D-WG-20230201	02/01/2023 11:00	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 16:58
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 11:32
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/23/2023 11:15
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:12
23020169-004D	APW-06D-WG-20230201	02/01/2023 11:00	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 21:51
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 13:47
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 13:06
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/15/2023 8:47
23020169-005A	APW-05-WG-20230201	02/01/2023 12:25	02/03/2023 8:45		

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:50
	SW-846 9036 (Total)				02/10/2023 13:33
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:12
	SW-846 9214 (Total)				02/09/2023 15:35
	SW-846 9251 (Total)				02/10/2023 13:27
23020169-005B	APW-05-WG-20230201	02/01/2023 12:25	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-005C	APW-05-WG-20230201	02/01/2023 12:25	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 17:05
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 11:39
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/23/2023 11:34
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:14
23020169-005D	APW-05-WG-20230201	02/01/2023 12:25	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 22:10
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 13:53
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 13:26
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/15/2023 18:31
23020169-006A	APW-02-WG-20230201	02/01/2023 13:50	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:51
	SW-846 9036 (Total)				02/10/2023 13:40
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:16
	SW-846 9214 (Total)				02/09/2023 15:37
	SW-846 9251 (Total)				02/10/2023 13:35
23020169-006B	APW-02-WG-20230201	02/01/2023 13:50	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-006C	APW-02-WG-20230201	02/01/2023 13:50	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 17:11
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 11:45
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/20/2023 9:48
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:16
23020169-006D	APW-02-WG-20230201	02/01/2023 13:50	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 21:57
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 15:01
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 13:11
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/15/2023 8:52
23020169-007A	APW-09-WG-20230201	02/01/2023 15:50	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:51

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 9036 (Total)				02/10/2023 13:43
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:19
	SW-846 9214 (Total)				02/09/2023 15:39
	SW-846 9251 (Total)				02/10/2023 13:43
23020169-007B	APW-09-WG-20230201	02/01/2023 15:50	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-007C	APW-09-WG-20230201	02/01/2023 15:50	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 17:17
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 12:49
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/23/2023 11:53
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:19
23020169-007D	APW-09-WG-20230201	02/01/2023 15:50	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 22:04
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 15:07
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 13:16
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/24/2023 10:46
23020169-008A	APW-08-WG-20230202	02/02/2023 9:45	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/07/2023 12:03
	SW-846 9036 (Total)				02/10/2023 13:51
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:21
	SW-846 9214 (Total)				02/09/2023 15:41
	SW-846 9251 (Total)				02/10/2023 13:51
23020169-008B	APW-08-WG-20230202	02/02/2023 9:45	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-008C	APW-08-WG-20230202	02/02/2023 9:45	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 18:33
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 12:56
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/23/2023 12:12
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/24/2023 10:59
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:21
23020169-008D	APW-08-WG-20230202	02/02/2023 9:45	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/10/2023 22:54
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/13/2023 15:14
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/14/2023 13:21
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:06	02/24/2023 11:05
23020169-009A	APW-10S-WG-20230202	02/02/2023 11:10	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/07/2023 12:04

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 9036 (Total)				02/10/2023 14:15
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:26
	SW-846 9214 (Total)				02/09/2023 15:43
	SW-846 9251 (Total)				02/10/2023 14:15
23020169-009B	APW-10S-WG-20230202	02/02/2023 11:10	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-009C	APW-10S-WG-20230202	02/02/2023 11:10	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 18:39
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 13:02
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/20/2023 9:55
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:28
23020169-009D	APW-10S-WG-20230202	02/02/2023 11:10	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/10/2023 15:35
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/13/2023 9:52
23020169-010A	APW-10D-WG-20230202	02/02/2023 12:30	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/06/2023 12:49
	SW-846 9036 (Total)				02/10/2023 14:23
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:27
	SW-846 9214 (Total)				02/09/2023 15:45
	SW-846 9251 (Total)				02/10/2023 14:23
23020169-010B	APW-10D-WG-20230202	02/02/2023 12:30	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-010C	APW-10D-WG-20230202	02/02/2023 12:30	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 18:45
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 13:08
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:34
23020169-010D	APW-10D-WG-20230202	02/02/2023 12:30	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/10/2023 15:41
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/13/2023 9:59
23020169-011A	APW-04-WG-20230202	02/02/2023 14:05	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/06/2023 12:49
	SW-846 9036 (Total)				02/13/2023 11:51
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:29
	SW-846 9214 (Total)				02/09/2023 15:55
	SW-846 9251 (Total)				02/10/2023 14:31
23020169-011B	APW-04-WG-20230202	02/02/2023 14:05	02/03/2023 8:45		

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	EPA 903.0/904.0, Radium 226/228				02/10/2023 0:00
23020169-011C	APW-04-WG-20230202	02/02/2023 14:05	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 18:51
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 13:15
	SW-846 7470A (Total)			02/09/2023 10:45	02/10/2023 19:37
23020169-011D	APW-04-WG-20230202	02/02/2023 14:05	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/10/2023 16:06
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/13/2023 10:24
23020169-012A	APW-01R-WG-20230202	02/02/2023 15:10	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/06/2023 12:49
	SW-846 9036 (Total)				02/13/2023 12:08
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:31
	SW-846 9214 (Total)				02/09/2023 15:58
	SW-846 9251 (Total)				02/10/2023 14:42
23020169-012B	APW-01R-WG-20230202	02/02/2023 15:10	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/16/2023 0:00
23020169-012C	APW-01R-WG-20230202	02/02/2023 15:10	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/15/2023 18:58
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:27	02/16/2023 13:21
	SW-846 7470A (Total)			02/09/2023 10:46	02/10/2023 11:37
23020169-012D	APW-01R-WG-20230202	02/02/2023 15:10	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/10/2023 15:47
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/13/2023 10:05
23020169-013A	EB-01-WQ-20230130	01/30/2023 9:40	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/22/2023 11:44
	SW-846 9036 (Total)				02/10/2023 15:19
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:37
	SW-846 9214 (Total)				02/09/2023 15:59
	SW-846 9251 (Total)				02/10/2023 15:19
23020169-013B	EB-01-WQ-20230130	01/30/2023 9:40	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/16/2023 0:00
23020169-013C	EB-01-WQ-20230130	01/30/2023 9:40	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/15/2023 20:13
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/16/2023 14:25
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/17/2023 9:37
	SW-846 7470A (Total)			02/09/2023 10:46	02/10/2023 11:39

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23020169-013E	EB-01-WQ-20230130	01/30/2023 9:40	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/15/2023 16:05	02/16/2023 16:33
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/15/2023 16:05	02/18/2023 5:39
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/15/2023 16:05	02/20/2023 12:15
23020169-014A	DUP-01-WG-20230201	02/01/2023 0:01	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:51
	SW-846 9036 (Total)				02/10/2023 15:32
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:40
	SW-846 9214 (Total)				02/09/2023 16:02
	SW-846 9251 (Total)				02/10/2023 15:27
23020169-014B	DUP-01-WG-20230201	02/01/2023 0:01	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/16/2023 0:00
23020169-014C	DUP-01-WG-20230201	02/01/2023 0:01	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/15/2023 20:19
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/16/2023 14:31
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/17/2023 9:43
	SW-846 7470A (Total)			02/09/2023 10:46	02/10/2023 11:50
23020169-014D	DUP-01-WG-20230201	02/01/2023 0:01	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/10/2023 15:54
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/13/2023 10:11
23020169-015A	DUP-02-WG-20230201	02/01/2023 0:02	02/03/2023 8:45		
	Standard Methods 2540 C (Total) 1997, 2011				02/03/2023 14:52
	SW-846 9036 (Total)				02/10/2023 15:40
	SW-846 9040B, Laboratory Analyzed				02/08/2023 16:42
	SW-846 9214 (Total)				02/09/2023 16:04
	SW-846 9251 (Total)				02/10/2023 15:35
23020169-015B	DUP-02-WG-20230201	02/01/2023 0:02	02/03/2023 8:45		
	EPA 903.0/904.0, Radium 226/228				02/16/2023 0:00
23020169-015C	DUP-02-WG-20230201	02/01/2023 0:02	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/15/2023 20:25
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/16/2023 14:57
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			02/15/2023 6:37	02/17/2023 9:50
	SW-846 7470A (Total)			02/09/2023 10:46	02/10/2023 11:53
23020169-015D	DUP-02-WG-20230201	02/01/2023 0:02	02/03/2023 8:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/10/2023 16:00
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			02/09/2023 11:07	02/13/2023 10:17

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

STANDARD METHODS 2540 C (TOTAL) 1997, 2011

Batch R324399 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/03/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/03/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/03/2023

Batch R324399 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**916**	1000	0	91.6	90	110	02/03/2023
Total Dissolved Solids		20		**986**	1000	0	98.6	90	110	02/03/2023
Total Dissolved Solids		20		**904**	1000	0	90.4	90	110	02/03/2023

Batch R324475 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/06/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/06/2023

Batch R324475 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**936**	1000	0	93.6	90	110	02/06/2023
Total Dissolved Solids		20		**932**	1000	0	93.2	90	110	02/06/2023

Batch R324475 **SampType:** DUP Units **mg/L** RPD Limit: **5**
SampID: 23020169-002ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		20		**832**				824.0	0.97	02/06/2023

Batch R324544 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/07/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

STANDARD METHODS 2540 C (TOTAL) 1997, 2011

Batch R324544 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**962**	1000	0	96.2	90	110	02/07/2023

Batch R324544 **SampType:** DUP Units **mg/L** RPD Limit: **5**
SampID: 23020169-009ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		50		**780**				780.0	0.00	02/07/2023

Batch R325126 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/21/2023

Batch R325126 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**934**	1000	0	93.4	90	110	02/21/2023

Batch R325208 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/22/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	02/22/2023

Batch R325208 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**912**	1000	0	91.2	90	110	02/22/2023
Total Dissolved Solids		20		**1040**	1000	0	104.4	90	110	02/22/2023

SW-846 9036 (TOTAL)

Batch R324668 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 9036 (TOTAL)

Batch R324668 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	96.0	90	110	02/10/2023

Batch R324668 **SampType:** MS Units **mg/L**
SampID: 23020169-003AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		100		**434**	200.0	247.3	93.6	85	115	02/10/2023

Batch R324668 **SampType:** MSD Units **mg/L** RPD Limit: **10**
SampID: 23020169-003AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		100		**436**	200.0	247.3	94.5	434.5	0.39	02/10/2023

Batch R324732 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	02/13/2023

Batch R324732 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	96.2	90	110	02/13/2023

Batch R324732 **SampType:** MS Units **mg/L**
SampID: 23020169-012AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		50		**168**	100.0	74.09	93.7	85	115	02/13/2023

Batch R324732 **SampType:** MSD Units **mg/L** RPD Limit: **10**
SampID: 23020169-012AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		50		**166**	100.0	74.09	91.8	167.8	1.13	02/13/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 9040B, LABORATORY ANALYZED

Batch R324523 **SampType:** LCS Units

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		**7.01**	7.000	0	100.1	99.1	100.8	02/07/2023

Batch R324541 **SampType:** LCS Units

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		**6.97**	7.000	0	99.6	99.1	100.8	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-001ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.45**				7.450	0.00	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-002ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.23**				7.230	0.00	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-003ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.16**				7.120	0.56	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-004ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.28**				7.290	0.14	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-005ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.32**				7.310	0.14	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-006ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.02**				6.980	0.57	02/08/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 9040B, LABORATORY ANALYZED

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-007ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.72**				7.720	0.00	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-008ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.35**				7.310	0.55	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-009ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.20**				7.200	0.00	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-010ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.57**				7.570	0.00	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-011ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.23**				7.210	0.28	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-012ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**6.58**				6.570	0.15	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-013ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**5.48**				5.540	1.09	02/08/2023

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-014ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.34**				7.330	0.14	02/08/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 9040B, LABORATORY ANALYZED

Batch R324541 **SampType:** DUP Units RPD Limit: **10**

SampID: 23020169-015ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00		**7.06**				7.050	0.14	02/08/2023

SW-846 9214 (TOTAL)

Batch R324472 **SampType:** MBLK Units **mg/L**

SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**< 0.10**	0.0370	0	0	-100	100	02/07/2023

Batch R324472 **SampType:** LCS Units **mg/L**

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**0.98**	1.000	0	97.8	90	110	02/07/2023

Batch R324472 **SampType:** MS Units **mg/L**

SampID: 23020169-002AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.33**	2.000	0.1930	107.0	75	125	02/07/2023

Batch R324472 **SampType:** MSD Units **mg/L** RPD Limit: **15**

SampID: 23020169-002AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.34**	2.000	0.1930	107.2	2.334	0.09	02/07/2023

Batch R324574 **SampType:** MBLK Units **mg/L**

SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**< 0.10**	0.0370	0	0	-100	100	02/09/2023

Batch R324574 **SampType:** LCS Units **mg/L**

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**1.00**	1.000	0	99.9	90	110	02/09/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 9214 (TOTAL)

Batch R324574 **SampType:** MS Units **mg/L**
SampID: 23020169-001AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.22**	2.000	0.2320	99.3	75	125	02/09/2023

Batch R324574 **SampType:** MSD Units **mg/L** RPD Limit: **15**
SampID: 23020169-001AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.30**	2.000	0.2320	103.2	2.218	3.46	02/09/2023

Batch R324574 **SampType:** MS Units **mg/L**
SampID: 23020169-010AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.15**	2.000	0.1150	101.6	75	125	02/09/2023

Batch R324574 **SampType:** MSD Units **mg/L** RPD Limit: **15**
SampID: 23020169-010AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.18**	2.000	0.1150	103.0	2.146	1.34	02/09/2023

Batch R324574 **SampType:** MS Units **mg/L**
SampID: 23020169-015AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.24**	2.000	0.2210	100.9	75	125	02/09/2023

Batch R324574 **SampType:** MSD Units **mg/L** RPD Limit: **15**
SampID: 23020169-015AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.34**	2.000	0.2210	106.2	2.239	4.62	02/09/2023

SW-846 9251 (TOTAL)

Batch R324670 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		1		**< 1**	0.5000	0	0	-100	100	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 9251 (TOTAL)

Batch R324670 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		1		**20**	20.00	0	98.4	90	110	02/10/2023

Batch R324670 **SampType:** MS Units **mg/L**
SampID: 23020169-003AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		1		**43**	20.00	24.41	92.5	85	115	02/10/2023

Batch R324670 **SampType:** MSD Units **mg/L** RPD Limit: **15**
SampID: 23020169-003AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		1		**42**	20.00	24.41	89.6	42.91	1.36	02/10/2023

Batch R324670 **SampType:** MS Units **mg/L**
SampID: 23020169-012AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		1		**27**	20.00	7.260	99.2	85	115	02/10/2023

Batch R324670 **SampType:** MSD Units **mg/L** RPD Limit: **15**
SampID: 23020169-012AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		1		**26**	20.00	7.260	95.5	27.09	2.73	02/10/2023

Batch R324741 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		1		**< 1**	0.5000	0	0	-100	100	02/13/2023

Batch R324741 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		1		**21**	20.00	0	103.0	90	110	02/13/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 202752 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202752

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/10/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/10/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	02/10/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	02/10/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	02/10/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/10/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	02/13/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	02/13/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/10/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/10/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	02/10/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	02/13/2023
Nickel		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/10/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/10/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	02/10/2023

Batch 202752 **SampType:** LCS Units **mg/L**

SampID: LCS-202752

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.434**	0.5000	0	86.7	80	120	02/10/2023
Arsenic		0.0010		**0.474**	0.5000	0	94.8	80	120	02/10/2023
Barium		0.0010		**1.92**	2.000	0	95.9	80	120	02/10/2023
Beryllium		0.0010		**0.0465**	0.0500	0	93.0	80	120	02/10/2023
Boron		0.0250		**0.489**	0.5000	0	97.9	80	120	02/10/2023
Cadmium		0.0010		**0.0454**	0.0500	0	90.8	80	120	02/10/2023
Calcium		0.125		**2.37**	2.500	0	94.7	80	120	02/13/2023
Chromium		0.0015		**0.183**	0.2000	0	91.3	80	120	02/13/2023
Cobalt		0.0010		**0.443**	0.5000	0	88.7	80	120	02/10/2023
Lead		0.0010		**0.476**	0.5000	0	95.1	80	120	02/10/2023
Lithium	*	0.0030		**0.463**	0.5000	0	92.7	80	120	02/10/2023
Molybdenum		0.0015		**0.446**	0.5000	0	89.1	80	120	02/13/2023
Nickel		0.0010		**0.446**	0.5000	0	89.2	80	120	02/10/2023
Selenium		0.0010		**0.444**	0.5000	0	88.8	80	120	02/10/2023
Thallium		0.0020		**0.234**	0.2500	0	93.5	80	120	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 202752 **SampType:** MS Units **mg/L**

SampID: 23020169-005DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.444**	0.5000	0	88.8	75	125	02/10/2023
Arsenic		0.0010		**0.455**	0.5000	0.002554	90.4	75	125	02/10/2023
Barium		0.0010		**2.12**	2.000	0.1750	97.1	75	125	02/10/2023
Beryllium		0.0010		**0.0438**	0.0500	0	87.6	75	125	02/10/2023
Boron		0.0250	S	**6.92**	0.5000	8.675	-351.8	75	125	02/10/2023
Cadmium		0.0010		**0.0432**	0.0500	0	86.4	75	125	02/10/2023
Calcium		0.125	S	**137**	2.500	106.1	1231	75	125	02/15/2023
Chromium		0.0015		**0.184**	0.2000	0	92.1	75	125	02/14/2023
Cobalt		0.0010		**0.437**	0.5000	0.0005994	87.2	75	125	02/14/2023
Lead		0.0010		**0.483**	0.5000	0	96.6	75	125	02/10/2023
Lithium	*	0.0030		**0.472**	0.5000	0.04503	85.5	75	125	02/10/2023
Molybdenum		0.0015		**0.672**	0.5000	0.1868	97.1	75	125	02/13/2023
Nickel		0.0010		**0.436**	0.5000	0.001739	86.8	75	125	02/14/2023
Selenium		0.0010		**0.426**	0.5000	0	85.2	75	125	02/10/2023
Thallium		0.0020		**0.234**	0.2500	0	93.8	75	125	02/10/2023

Batch 202752 **SampType:** MSD Units **mg/L** RPD Limit: **20**

SampID: 23020169-005DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.454**	0.5000	0	90.8	0.4442	2.17	02/10/2023
Arsenic		0.0010		**0.465**	0.5000	0.002554	92.4	0.4548	2.12	02/10/2023
Barium		0.0010		**2.15**	2.000	0.1750	98.8	2.117	1.60	02/10/2023
Beryllium		0.0010		**0.0436**	0.0500	0	87.2	0.04382	0.50	02/10/2023
Boron		0.0250	S	**7.12**	0.5000	8.675	-310.6	6.916	2.94	02/10/2023
Cadmium		0.0010		**0.0441**	0.0500	0	88.2	0.04320	2.10	02/10/2023
Calcium		0.125	S	**152**	2.500	106.1	1840	136.9	10.54	02/15/2023
Chromium		0.0015		**0.202**	0.2000	0	100.9	0.1842	9.13	02/14/2023
Cobalt		0.0010		**0.491**	0.5000	0.0005994	98.0	0.4365	11.67	02/14/2023
Lead		0.0010		**0.487**	0.5000	0	97.5	0.4832	0.86	02/10/2023
Lithium	*	0.0030		**0.476**	0.5000	0.04503	86.2	0.4725	0.73	02/10/2023
Molybdenum		0.0015		**0.642**	0.5000	0.1868	91.1	0.6724	4.59	02/13/2023
Nickel		0.0010		**0.477**	0.5000	0.001739	95.1	0.4358	9.07	02/14/2023
Selenium		0.0010		**0.432**	0.5000	0	86.4	0.4260	1.39	02/10/2023
Thallium		0.0020		**0.229**	0.2500	0	91.6	0.2344	2.36	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 202753 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202753

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/13/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/10/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	02/10/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	02/13/2023
Boron	*	0.0250		**< 0.0250**	0.0093	0	0	-100	100	02/10/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/13/2023
Calcium	*	0.125		**< 0.125**	0.0700	0	0	-100	100	02/13/2023
Chromium		0.0150		**< 0.0150**	0.0007	0	0	-100	100	02/13/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/13/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/10/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	02/10/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	02/13/2023
Nickel		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/10/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/10/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	02/10/2023

Batch 202753 **SampType:** LCS Units **mg/L**

SampID: LCS-202753

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.454**	0.5000	0	90.8	85	115	02/13/2023
Arsenic		0.0010		**0.475**	0.5000	0	94.9	85	115	02/10/2023
Barium		0.0010		**1.93**	2.000	0	96.5	85	115	02/10/2023
Beryllium		0.0010		**0.0456**	0.0500	0	91.3	85	115	02/13/2023
Boron	*	0.0250		**0.447**	0.5000	0	89.4	85	115	02/10/2023
Cadmium		0.0010		**0.0469**	0.0500	0	93.7	85	115	02/13/2023
Calcium	*	0.125		**2.48**	2.500	0	99.0	85	115	02/13/2023
Chromium		0.0150		**0.194**	0.2000	0	97.0	85	115	02/13/2023
Cobalt		0.0010		**0.490**	0.5000	0	97.9	85	115	02/13/2023
Lead		0.0010		**0.463**	0.5000	0	92.5	85	115	02/10/2023
Lithium	*	0.0030		**0.439**	0.5000	0	87.8	85	115	02/10/2023
Molybdenum		0.0015		**0.463**	0.5000	0	92.5	85	115	02/13/2023
Nickel		0.0010		**0.461**	0.5000	0	92.3	85	115	02/10/2023
Selenium		0.0010		**0.435**	0.5000	0	86.9	85	115	02/10/2023
Thallium		0.0020		**0.227**	0.2500	0	90.7	85	115	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 202753 **SampType:** MS Units **mg/L**

SampID: 23020169-011DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.449**	0.5000	0	89.8	75	125	02/13/2023
Arsenic		0.0010		**0.438**	0.5000	0.001128	87.4	75	125	02/10/2023
Barium		0.0010		**1.94**	2.000	0.1158	91.3	75	125	02/10/2023
Beryllium		0.0010		**0.0490**	0.0500	0	98.0	75	125	02/13/2023
Boron		0.0250		**1.04**	0.5000	0.6186	83.4	75	125	02/10/2023
Cadmium		0.0010		**0.0460**	0.0500	0	91.9	75	125	02/13/2023
Calcium		0.125	S	**95.1**	2.500	93.35	72.1	75	125	02/13/2023
Chromium		0.0015		**0.180**	0.2000	0	90.0	75	125	02/13/2023
Cobalt		0.0010		**0.454**	0.5000	0	90.8	75	125	02/13/2023
Lead		0.0010		**0.450**	0.5000	0	90.0	75	125	02/10/2023
Lithium	*	0.0030		**0.469**	0.5000	0.02915	88.0	75	125	02/10/2023
Molybdenum		0.0015		**0.493**	0.5000	0.03831	91.0	75	125	02/13/2023
Nickel		0.0010		**0.399**	0.5000	0.002098	79.5	75	125	02/10/2023
Selenium		0.0010		**0.418**	0.5000	0.008992	81.7	75	125	02/10/2023
Thallium		0.0020		**0.225**	0.2500	0	90.0	75	125	02/10/2023

Batch 202753 **SampType:** MSD Units **mg/L** RPD Limit: **20**

SampID: 23020169-011DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.449**	0.5000	0	89.7	0.4489	0.05	02/13/2023
Arsenic		0.0010		**0.481**	0.5000	0.001128	95.9	0.4380	9.31	02/10/2023
Barium		0.0010		**2.06**	2.000	0.1158	97.2	1.942	5.88	02/10/2023
Beryllium		0.0010		**0.0478**	0.0500	0	95.5	0.04900	2.58	02/13/2023
Boron		0.0250		**1.07**	0.5000	0.6186	90.0	1.036	3.13	02/10/2023
Cadmium		0.0010		**0.0454**	0.0500	0	90.8	0.04597	1.25	02/13/2023
Calcium		0.125	S	**93.6**	2.500	93.35	11.6	95.15	1.60	02/13/2023
Chromium		0.0015		**0.179**	0.2000	0	89.6	0.1799	0.43	02/13/2023
Cobalt		0.0010		**0.459**	0.5000	0	91.8	0.4541	1.05	02/13/2023
Lead		0.0010		**0.488**	0.5000	0	97.6	0.4500	8.14	02/10/2023
Lithium	*	0.0030		**0.492**	0.5000	0.02915	92.6	0.4692	4.79	02/10/2023
Molybdenum		0.0015		**0.497**	0.5000	0.03831	91.8	0.4931	0.82	02/13/2023
Nickel		0.0010		**0.438**	0.5000	0.002098	87.3	0.3995	9.32	02/10/2023
Selenium		0.0010		**0.455**	0.5000	0.008992	89.2	0.4176	8.61	02/10/2023
Thallium		0.0020		**0.243**	0.2500	0	97.1	0.2251	7.51	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 202963 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202963

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	02/16/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	02/17/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	02/17/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	02/16/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	02/16/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/16/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/16/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	02/17/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	02/17/2023
Nickel		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/16/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	02/16/2023

Batch 202963 **SampType:** LCS Units **mg/L**

SampID: LCS-202963

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010	S	**0.611**	0.5000	0	122.2	80	120	02/16/2023
Arsenic		0.0010	S	**0.638**	0.5000	0	127.7	80	120	02/16/2023
Barium		0.0010	S	**2.60**	2.000	0	129.9	80	120	02/16/2023
Beryllium		0.0010		**0.0420**	0.0500	0	84.1	80	120	02/17/2023
Boron		0.0250		**0.422**	0.5000	0	84.4	80	120	02/17/2023
Cadmium		0.0010		**0.0407**	0.0500	0	81.3	80	120	02/17/2023
Calcium		0.125		**2.84**	2.500	0	113.5	80	120	02/16/2023
Chromium		0.0015		**0.234**	0.2000	0	117.1	80	120	02/16/2023
Cobalt		0.0010		**0.591**	0.5000	0	118.1	80	120	02/16/2023
Lead		0.0010		**0.590**	0.5000	0	118.1	80	120	02/16/2023
Lithium	*	0.0030		**0.437**	0.5000	0	87.5	80	120	02/17/2023
Molybdenum		0.0015		**0.402**	0.5000	0	80.4	80	120	02/17/2023
Nickel		0.0010		**0.574**	0.5000	0	114.8	80	120	02/16/2023
Thallium		0.0020		**0.296**	0.2500	0	118.3	80	120	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 202963 **SampType:** MS Units **mg/L**

SampID: 23020169-013EMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.560**	0.5000	0	112.1	75	125	02/16/2023
Arsenic		0.0010		**0.586**	0.5000	0	117.2	75	125	02/16/2023
Barium		0.0010		**2.45**	2.000	0	122.7	75	125	02/16/2023
Beryllium		0.0010		**0.0424**	0.0500	0	84.9	75	125	02/18/2023
Boron		0.0250	S	**0.697**	0.5000	0	139.4	75	125	02/20/2023
Cadmium		0.0010		**0.0435**	0.0500	0	87.0	75	125	02/18/2023
Calcium		0.125		**2.78**	2.500	0	111.3	75	125	02/16/2023
Chromium		0.0015		**0.215**	0.2000	0	107.7	75	125	02/16/2023
Cobalt		0.0010		**0.552**	0.5000	0	110.3	75	125	02/16/2023
Lead		0.0010		**0.551**	0.5000	0	110.2	75	125	02/16/2023
Lithium	*	0.0030		**0.449**	0.5000	0	89.8	75	125	02/18/2023
Molybdenum		0.0015		**0.432**	0.5000	0	86.5	75	125	02/18/2023
Nickel		0.0010		**0.534**	0.5000	0.0004881	106.7	75	125	02/16/2023
Selenium		0.0010		**0.558**	0.5000	0	111.6	75	125	02/16/2023
Thallium		0.0020		**0.271**	0.2500	0	108.5	75	125	02/16/2023

Batch 202963 **SampType:** MSD Units **mg/L** RPD Limit: **20**

SampID: 23020169-013EMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.533**	0.5000	0	106.7	0.5603	4.95	02/16/2023
Arsenic		0.0010		**0.536**	0.5000	0	107.2	0.5862	8.98	02/16/2023
Barium		0.0010		**2.32**	2.000	0	116.2	2.455	5.50	02/16/2023
Beryllium		0.0010		**0.0413**	0.0500	0	82.6	0.04243	2.69	02/18/2023
Boron		0.0250	S	**0.667**	0.5000	0	133.4	0.6970	4.37	02/20/2023
Cadmium		0.0010		**0.0430**	0.0500	0	86.0	0.04352	1.16	02/18/2023
Calcium		0.125		**2.46**	2.500	0	98.3	2.783	12.38	02/16/2023
Chromium		0.0015		**0.202**	0.2000	0	101.2	0.2154	6.21	02/16/2023
Cobalt		0.0010		**0.505**	0.5000	0	101.0	0.5517	8.79	02/16/2023
Lead		0.0010		**0.505**	0.5000	0	100.9	0.5508	8.75	02/16/2023
Lithium	*	0.0030		**0.441**	0.5000	0	88.3	0.4488	1.66	02/18/2023
Molybdenum		0.0015		**0.433**	0.5000	0	86.6	0.4323	0.16	02/18/2023
Nickel		0.0010		**0.489**	0.5000	0.0004881	97.8	0.5339	8.69	02/16/2023
Selenium		0.0010		**0.511**	0.5000	0	102.2	0.5579	8.76	02/16/2023
Thallium		0.0020		**0.248**	0.2500	0	99.4	0.2712	8.76	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202662 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202662

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/09/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	02/09/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	02/09/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	02/09/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/09/2023
Calcium		0.125		**< 0.125**	0.1150	0	0	-100	100	02/10/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	02/10/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/09/2023
Iron		0.0250		**< 0.0250**	0.0115	0	0	-100	100	02/09/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/09/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	02/09/2023
Manganese		0.0020		**< 0.0020**	0.0008	0	0	-100	100	02/09/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	02/09/2023
Nickel		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/09/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/09/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	02/09/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202662 **SampType:** LCS Units **mg/L**

SampID: LCS-202662

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.438**	0.5000	0	87.5	80	120	02/09/2023
Arsenic		0.0010		**0.465**	0.5000	0	93.0	80	120	02/09/2023
Barium		0.0010		**1.82**	2.000	0	91.2	80	120	02/09/2023
Beryllium		0.0010		**0.0436**	0.0500	0	87.3	80	120	02/09/2023
Boron		0.0250		**0.441**	0.5000	0	88.2	80	120	02/09/2023
Cadmium		0.0010		**0.0439**	0.0500	0	87.8	80	120	02/09/2023
Calcium		0.125		**2.13**	2.500	0	85.4	80	120	02/10/2023
Chromium		0.0015		**0.175**	0.2000	0	87.5	80	120	02/10/2023
Cobalt		0.0010		**0.472**	0.5000	0	94.4	80	120	02/09/2023
Iron		0.0250		**1.79**	2.000	0	89.3	80	120	02/09/2023
Lead		0.0010		**0.439**	0.5000	0	87.8	80	120	02/09/2023
Lithium	*	0.0030		**0.447**	0.5000	0	89.4	80	120	02/09/2023
Manganese		0.0020		**0.449**	0.5000	0	89.7	80	120	02/09/2023
Molybdenum		0.0015		**0.433**	0.5000	0	86.6	80	120	02/09/2023
Nickel		0.0010		**0.463**	0.5000	0	92.6	80	120	02/09/2023
Selenium		0.0010		**0.424**	0.5000	0	84.8	80	120	02/09/2023
Thallium		0.0020		**0.217**	0.2500	0	86.7	80	120	02/09/2023

Batch 202807 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202807

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/13/2023

Batch 202807 **SampType:** LCS Units **mg/L**

SampID: LCS-202807

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Arsenic		0.0010		**0.545**	0.5000	0	109.0	80	120	02/13/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202915 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202915

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/15/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	02/15/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	02/16/2023
Boron	*	0.0250		**< 0.0250**	0.0093	0	0	-100	100	02/16/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/16/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	02/17/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	02/17/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/16/2023
Iron		0.0250		**< 0.0250**	0.0115	0	0	-100	100	02/17/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/15/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	02/17/2023
Manganese		0.0020		**< 0.0020**	0.0008	0	0	-100	100	02/17/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	02/16/2023
Nickel		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/16/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	02/15/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202915 **SampType:** LCS Units **mg/L**

SampID: LCS-202915

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.509**	0.5000	0	101.8	85	115	02/16/2023
Arsenic		0.0010		**0.554**	0.5000	0	110.8	85	115	02/16/2023
Barium		0.0010		**2.19**	2.000	0	109.5	85	115	02/16/2023
Beryllium		0.0010		**0.0509**	0.0500	0	101.9	85	115	02/16/2023
Boron	*	0.0250		**0.509**	0.5000	0	101.8	85	115	02/16/2023
Cadmium		0.0010		**0.0502**	0.0500	0	100.4	85	115	02/16/2023
Calcium	*	0.125		**2.66**	2.500	0	106.5	85	115	02/16/2023
Chromium		0.0015		**0.210**	0.2000	0	104.9	85	115	02/16/2023
Cobalt		0.0010		**0.548**	0.5000	0	109.7	85	115	02/16/2023
Iron	*	0.0250		**2.15**	2.000	0	107.5	85	115	02/16/2023
Lead		0.0010		**0.521**	0.5000	0	104.3	85	115	02/16/2023
Lithium	*	0.0030		**0.515**	0.5000	0	103.0	85	115	02/16/2023
Manganese		0.0020		**0.531**	0.5000	0	106.2	85	115	02/16/2023
Molybdenum		0.0015		**0.510**	0.5000	0	102.0	85	115	02/16/2023
Nickel		0.0010		**0.539**	0.5000	0	107.9	85	115	02/16/2023
Selenium		0.0010		**0.506**	0.5000	0	101.2	85	115	02/16/2023
Thallium		0.0020		**0.257**	0.2500	0	102.8	85	115	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202915 **SampType:** MS Units **mg/L**

SampID: 23020169-003CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.514**	0.5000	0	102.8	75	125	02/16/2023
Arsenic		0.0010		**0.543**	0.5000	0.001099	108.3	75	125	02/16/2023
Barium		0.0010		**2.29**	2.000	0.2020	104.2	75	125	02/16/2023
Beryllium		0.0010		**0.0532**	0.0500	0	106.3	75	125	02/16/2023
Boron		0.0250	S	**7.61**	0.5000	6.842	154.2	75	125	02/16/2023
Cadmium		0.0010		**0.0505**	0.0500	0	101.0	75	125	02/16/2023
Calcium		0.125	S	**103**	2.500	97.08	240.5	75	125	02/16/2023
Chromium		0.0015		**0.200**	0.2000	0.0008781	99.3	75	125	02/16/2023
Cobalt		0.0010		**0.514**	0.5000	0.0001671	102.9	75	125	02/16/2023
Iron		0.0250		**11.3**	2.000	9.074	111.9	75	125	02/16/2023
Lead		0.0010		**0.518**	0.5000	0	103.6	75	125	02/16/2023
Lithium	*	0.0030		**0.572**	0.5000	0.04058	106.2	75	125	02/16/2023
Manganese		0.0020		**1.03**	0.5000	0.5065	104.0	75	125	02/16/2023
Molybdenum		0.0015		**0.799**	0.5000	0.2648	106.9	75	125	02/16/2023
Nickel		0.0010		**0.497**	0.5000	0.001399	99.1	75	125	02/16/2023
Selenium		0.0010		**0.492**	0.5000	0	98.4	75	125	02/16/2023
Thallium		0.0020		**0.262**	0.2500	0	105.0	75	125	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202915 **SampType:** MSD Units **mg/L** RPD Limit: **20**

SampID: 23020169-003CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.518**	0.5000	0	103.7	0.5139	0.88	02/16/2023
Arsenic		0.0010		**0.556**	0.5000	0.001099	110.9	0.5426	2.39	02/16/2023
Barium		0.0010		**2.33**	2.000	0.2020	106.6	2.285	2.08	02/16/2023
Beryllium		0.0010		**0.0537**	0.0500	0	107.5	0.05317	1.08	02/16/2023
Boron		0.0250	S	**7.69**	0.5000	6.842	169.1	7.613	0.97	02/16/2023
Cadmium		0.0010		**0.0505**	0.0500	0	101.0	0.05051	0.02	02/16/2023
Calcium		0.125	S	**104**	2.500	97.08	272.9	103.1	0.78	02/16/2023
Chromium		0.0015		**0.204**	0.2000	0.0008781	101.7	0.1995	2.34	02/16/2023
Cobalt		0.0010		**0.521**	0.5000	0.0001671	104.2	0.5145	1.25	02/16/2023
Iron		0.0250		**11.5**	2.000	9.074	123.4	11.31	2.01	02/16/2023
Lead		0.0010		**0.517**	0.5000	0	103.4	0.5179	0.14	02/16/2023
Lithium	*	0.0030		**0.579**	0.5000	0.04058	107.7	0.5717	1.24	02/16/2023
Manganese		0.0020		**1.03**	0.5000	0.5065	105.5	1.027	0.69	02/16/2023
Molybdenum		0.0015		**0.804**	0.5000	0.2648	107.8	0.7995	0.54	02/16/2023
Nickel		0.0010		**0.502**	0.5000	0.001399	100.0	0.4967	0.98	02/16/2023
Selenium		0.0010		**0.498**	0.5000	0	99.5	0.4918	1.16	02/16/2023
Thallium		0.0020		**0.262**	0.2500	0	104.8	0.2625	0.13	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch **202915** **SampType:** **MS** Units **mg/L**

SampID: 23020169-012CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.490**	0.5000	0	98.0	75	125	02/16/2023
Arsenic		0.0010		**0.514**	0.5000	0.001571	102.4	75	125	02/16/2023
Barium		0.0010		**2.20**	2.000	0.1781	101.2	75	125	02/16/2023
Beryllium		0.0010		**0.0512**	0.0500	0	102.5	75	125	02/16/2023
Boron		0.0250		**0.709**	0.5000	0.2212	97.6	75	125	02/16/2023
Cadmium		0.0010		**0.0482**	0.0500	0	96.4	75	125	02/16/2023
Calcium		0.125	S	**75.5**	2.500	75.53	0.3	75	125	02/16/2023
Chromium		0.0015		**0.192**	0.2000	0.002176	95.0	75	125	02/16/2023
Cobalt		0.0010		**0.482**	0.5000	0.001273	96.2	75	125	02/16/2023
Iron		0.0250		**2.50**	2.000	0.6273	93.7	75	125	02/16/2023
Lead		0.0010		**0.496**	0.5000	0	99.1	75	125	02/16/2023
Lithium	*	0.0030		**0.530**	0.5000	0.01575	102.9	75	125	02/16/2023
Manganese		0.0020		**0.575**	0.5000	0.09643	95.8	75	125	02/16/2023
Molybdenum		0.0015		**0.468**	0.5000	0	93.6	75	125	02/16/2023
Nickel		0.0010		**0.469**	0.5000	0.008130	92.2	75	125	02/16/2023
Selenium		0.0010		**0.480**	0.5000	0.003666	95.2	75	125	02/16/2023
Thallium		0.0020		**0.246**	0.2500	0	98.4	75	125	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch **202915** **SampType:** **MSD** Units **mg/L** RPD Limit: **20**

SampID: 23020169-012CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.506**	0.5000	0	101.2	0.4901	3.17	02/16/2023
Arsenic		0.0010		**0.541**	0.5000	0.001571	107.8	0.5138	5.09	02/16/2023
Barium		0.0010		**2.23**	2.000	0.1781	102.8	2.202	1.45	02/16/2023
Beryllium		0.0010		**0.0519**	0.0500	0	103.8	0.05124	1.25	02/16/2023
Boron		0.0250		**0.725**	0.5000	0.2212	100.8	0.7091	2.27	02/16/2023
Cadmium		0.0010		**0.0486**	0.0500	0	97.1	0.04819	0.74	02/16/2023
Calcium		0.125	S	**76.7**	2.500	75.53	46.6	75.53	1.52	02/16/2023
Chromium		0.0015		**0.195**	0.2000	0.002176	96.5	0.1921	1.56	02/16/2023
Cobalt		0.0010		**0.494**	0.5000	0.001273	98.5	0.4824	2.35	02/16/2023
Iron		0.0250		**2.56**	2.000	0.6273	96.5	2.501	2.22	02/16/2023
Lead		0.0010		**0.499**	0.5000	0	99.8	0.4955	0.71	02/16/2023
Lithium	*	0.0030		**0.543**	0.5000	0.01575	105.5	0.5304	2.37	02/16/2023
Manganese		0.0020		**0.598**	0.5000	0.09643	100.3	0.5753	3.84	02/16/2023
Molybdenum		0.0015		**0.488**	0.5000	0	97.5	0.4678	4.15	02/16/2023
Nickel		0.0010		**0.481**	0.5000	0.008130	94.6	0.4694	2.44	02/16/2023
Selenium		0.0010		**0.509**	0.5000	0.003666	101.0	0.4799	5.81	02/16/2023
Thallium		0.0020		**0.254**	0.2500	0	101.5	0.2461	3.01	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202916 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202916

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/15/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	02/15/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	02/17/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	02/17/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/17/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	02/16/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	02/16/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	02/16/2023
Iron		0.0250		**< 0.0250**	0.0115	0	0	-100	100	02/16/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/15/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	02/17/2023
Manganese		0.0020		**< 0.0020**	0.0008	0	0	-100	100	02/16/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	02/17/2023
Nickel		0.0010		**< 0.0010**	0.0004	0	0	-100	100	02/16/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	02/16/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	02/15/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch **202916** **SampType:** **LCS** Units **mg/L**

SampID: LCS-202916

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.478**	0.5000	0	95.5	80	120	02/16/2023
Arsenic		0.0010		**0.506**	0.5000	0	101.2	80	120	02/16/2023
Barium		0.0010		**2.00**	2.000	0	100.0	80	120	02/16/2023
Beryllium		0.0010		**0.0495**	0.0500	0	98.9	80	120	02/17/2023
Boron		0.0250		**0.497**	0.5000	0	99.4	80	120	02/17/2023
Cadmium		0.0010		**0.0479**	0.0500	0	95.8	80	120	02/17/2023
Calcium		0.125		**2.32**	2.500	0	92.8	80	120	02/16/2023
Chromium		0.0015		**0.191**	0.2000	0	95.5	80	120	02/16/2023
Cobalt		0.0010		**0.486**	0.5000	0	97.2	80	120	02/16/2023
Iron		0.0250		**1.94**	2.000	0	97.1	80	120	02/16/2023
Lead		0.0010		**0.490**	0.5000	0	98.0	80	120	02/16/2023
Lithium	*	0.0030		**0.509**	0.5000	0	101.8	80	120	02/17/2023
Manganese		0.0020		**0.489**	0.5000	0	97.7	80	120	02/16/2023
Molybdenum		0.0015		**0.478**	0.5000	0	95.5	80	120	02/17/2023
Nickel		0.0010		**0.472**	0.5000	0	94.3	80	120	02/16/2023
Selenium		0.0010		**0.476**	0.5000	0	95.1	80	120	02/16/2023
Thallium		0.0020		**0.284**	0.2500	0	113.7	85	115	02/15/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202916 **SampType:** MS Units **mg/L**

SampID: 23020169-015CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.508**	0.5000	0	101.6	75	125	02/16/2023
Arsenic		0.0010		**0.534**	0.5000	0.01748	103.4	75	125	02/16/2023
Barium		0.0010		**2.34**	2.000	0.1588	108.9	75	125	02/16/2023
Beryllium		0.0010		**0.0505**	0.0500	0	101.0	75	125	02/17/2023
Boron		0.0250	S	**8.35**	0.5000	8.317	6.0	75	125	02/17/2023
Cadmium		0.0010		**0.0492**	0.0500	0.0002302	97.8	75	125	02/17/2023
Calcium		0.125	S	**146**	2.500	149.0	-107.6	75	125	02/16/2023
Chromium		0.0015		**0.189**	0.2000	0.002223	93.3	75	125	02/16/2023
Cobalt		0.0010		**0.469**	0.5000	0.0005275	93.7	75	125	02/16/2023
Iron		0.0250		**13.5**	2.000	11.66	89.6	75	125	02/16/2023
Lead		0.0010		**0.488**	0.5000	0.002327	97.2	75	125	02/16/2023
Lithium	*	0.0030		**0.562**	0.5000	0.04402	103.7	75	125	02/17/2023
Manganese		0.0020		**1.18**	0.5000	0.7120	93.7	75	125	02/16/2023
Molybdenum		0.0015		**0.653**	0.5000	0.1596	98.7	75	125	02/17/2023
Nickel		0.0010		**0.446**	0.5000	0.002271	88.7	75	125	02/16/2023
Selenium		0.0010		**0.499**	0.5000	0	99.8	75	125	02/16/2023
Thallium		0.0020		**0.242**	0.2500	0	96.7	75	125	02/16/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 202916 **SampType:** MSD Units **mg/L** RPD Limit: **20**

SampID: 23020169-015CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.486**	0.5000	0	97.3	0.5079	4.33	02/16/2023
Arsenic		0.0010		**0.524**	0.5000	0.01748	101.3	0.5344	1.95	02/16/2023
Barium		0.0010		**2.30**	2.000	0.1588	106.9	2.337	1.77	02/16/2023
Beryllium		0.0010		**0.0502**	0.0500	0	100.4	0.05049	0.61	02/17/2023
Boron		0.0250	S	**8.43**	0.5000	8.317	23.6	8.347	1.05	02/17/2023
Cadmium		0.0010		**0.0467**	0.0500	0.0002302	93.0	0.04915	5.05	02/17/2023
Calcium		0.125	S	**144**	2.500	149.0	-181.4	146.3	1.27	02/16/2023
Chromium		0.0015		**0.186**	0.2000	0.002223	92.1	0.1888	1.32	02/16/2023
Cobalt		0.0010		**0.453**	0.5000	0.0005275	90.5	0.4692	3.48	02/16/2023
Iron		0.0250		**13.7**	2.000	11.66	100.3	13.46	1.57	02/16/2023
Lead		0.0010		**0.481**	0.5000	0.002327	95.8	0.4884	1.50	02/16/2023
Lithium	*	0.0030		**0.564**	0.5000	0.04402	104.0	0.5624	0.28	02/17/2023
Manganese		0.0020		**1.16**	0.5000	0.7120	90.3	1.180	1.42	02/16/2023
Molybdenum		0.0015		**0.639**	0.5000	0.1596	96.0	0.6529	2.09	02/17/2023
Nickel		0.0010		**0.434**	0.5000	0.002271	86.4	0.4458	2.57	02/16/2023
Selenium		0.0010		**0.485**	0.5000	0	96.9	0.4992	2.96	02/16/2023
Thallium		0.0020		**0.239**	0.2500	0	95.5	0.2418	1.27	02/16/2023

SW-846 7470A (TOTAL)

Batch 202649 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202649

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	02/07/2023

Batch 202649 **SampType:** LCS Units **mg/L**

SampID: LCS-202649

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00466**	0.0050	0	93.2	85	115	02/07/2023

Batch 202649 **SampType:** MS Units **mg/L**

SampID: 23020169-002CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00475**	0.0050	0	95.0	75	125	02/07/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 7470A (TOTAL)

Batch 202649 **SampType:** MSD Units **mg/L** RPD Limit: **15**

SampID: 23020169-002CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00466**	0.0050	0	93.3	0.004748	1.78	02/07/2023

Batch 202742 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202742

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	02/10/2023

Batch 202742 **SampType:** LCS Units **mg/L**

SampID: LCS-202742

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00512**	0.0050	0	102.4	85	115	02/10/2023

Batch 202742 **SampType:** MS Units **mg/L**

SampID: 23020169-008CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00520**	0.0050	0	103.9	75	125	02/10/2023

Batch 202742 **SampType:** MSD Units **mg/L** RPD Limit: **15**

SampID: 23020169-008CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00503**	0.0050	0	100.6	0.005197	3.25	02/10/2023

Batch 202743 **SampType:** MBLK Units **mg/L**

SampID: MBLK-202743

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	02/10/2023

Batch 202743 **SampType:** LCS Units **mg/L**

SampID: LCS-202743

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00541**	0.0050	0	108.2	85	115	02/10/2023

Batch 202743 **SampType:** MS Units **mg/L**

SampID: 23020169-013CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00516**	0.0050	0	103.2	75	125	02/10/2023

Client: ERM **Work Order:** 23020169

Client Project: GTEC **Report Date:** 28-Feb-23

SW-846 7470A (TOTAL)

Batch **202743** **SampType:** **MSD** Units **mg/L** RPD Limit: **15**

SampID: 23020169-013CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00495**	0.0050	0	98.9	0.005159	4.22	02/10/2023

Receiving Check List

Teklab, Inc. Environmental Laboratory

http://www.teklabinc.com/

Client: ERM
Client Project: GTEC

Work Order: 23020169
Report Date: 28-Feb-23

Carrier: Clay Sansoucie

Completed by: Lindsey Maddox
On: 03-Feb-23

Received By: TWM

Reviewed by: Marvin L. Darling
On: 03-Feb-23

Pages to follow: Chain of custody 2 Extra pages included 30

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 1.6
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☐	No ☑		
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐	

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Any No responses must be detailed below or on the COC.

pH strip #87147. - lmaddox - 2/3/2023 10:56:50 AM

Additional nitric acid (86511) was needed in both 2L containters for samples APW-07-WG-20230130 and APW-10S-WG-20230202 and one APW-10D-WG-20230202 container upon arrival at the laboratory. - lmaddox - 2/3/2023 10:57:21 AM

No container was received for dissolved metals for EB-01-WQ-20230130. The sample was split, filtered and preserved upon arrival at the laboratory. Client was notified via workorder summary. LAM 2/3/23

CHAIN OF CUSTODY

pg. 1 of 2 Work order # 23020169

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client: ERM
Address: 1968 Craig Road
City / State / Zip: St. Louis, MO 63146
Contact: Matt Halley Phone: (314) 952-2760
E-Mail: matt.halley@erm.com Fax:

Samples on: [x] ICE [ ] BLUE ICE [ ] NO ICE 1.6 °C LTG# 3
Preserved in: [x] LAB [ ] FIELD **FOR LAB USE ONLY**
Lab Notes
APW-07 APW 10D
RH87147, Added HNO3(80511) APW-10S AC 2/3/23

Client Comments:
*Total and Dissolved: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Ni Se Tl

Field filtered for dissolved metals.

Are these samples known to be involved in litigation? If yes, a surcharge will apply [ ] Yes [x] No
Are these samples known to be hazardous? [ ] Yes [ ] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. [ ] Yes [ ] No

Project Name/Number: GTEC
Sample Collector's Name: Clay Sansoucie / Marshall Arendell

Results Requested: [x] Standard [ ] 1-2 Day (100% Surcharge) [ ] Other ____ [ ] 3 Day (50% Surcharge)

Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	Cl SO4	Dissolved Metals*	F- pH TDS	Radium 226/228	Total Fe/Mn	Total Hg	Total Metals*
23020169-001	APW-03-WG-20230130	1/30/23; 1330	1	2		2										X	X	X	X	X	X	X	X
-002	APW-07-WG-20230130	1/30/23; 1445	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-003	APW-06S-WG-20230201	2/1/23; 0910	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-004	APW-06D-WG-20230201	2/1/23; 1100	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-005	APW-05-WG-20230201	2/1/23; 1225	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-006	APW-02-WG-20230201	2/1/23; 1350	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-007	APW-09-WG-20230201	2/1/23; 1550	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-008	APW-08-WG-20230202	2/2/23; 0945	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-009	APW-10S-WG-20230202	2/2/23; 1110	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
-010	APW-10D-WG-20230202	2/2/23; 1230	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓

Relinquished By	Date/Time	Received By	Date/Time
Clay San[signature]	2/3/23; 0845	[signature]	2-3-23 0845

BottleOrder: 77879

AC 2/3/23

CHAIN OF CUSTODY

pg. 2 of 2 Work order # 23020169

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client:	ERM		
Address:	1968 Craig Road		
City / State / Zip	St. Louis, MO 63146		
Contact:	Matt Halley	**Phone:**	(314) 952-2760
E-Mail:	matt.halley@erm.com	**Fax:**	

Samples on: ☒ ICE ☒ BLUE ICE ☒ NO ICE _____ °C LTG# _____

Preserved in: ☒ LAB ☒ FIELD

FOR LAB USE ONLY

Lab Notes

Client Comments:

*Total and Dissolved: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Ni Se Tl

Field filtered for dissolved metals.

Are these samples known to be involved in litigation? If yes, a surcharge will apply ☐ Yes ☐ No

Are these samples known to be hazardous? ☐ Yes ☐ No

Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. ☐ Yes ☐ No

Project Name/Number: GTEC

Sample Collector's Name: Clay Sansoucie / Marshall Arenden

Results Requested: ☐ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other _____ ☐ 3 Day (50% Surcharge)

Billing Instructions:

 # and Type of Containers

MATRIX

INDICATE ANALYSIS REQUESTED

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	Cl SO4	Dissolved Metals*	F- pH TDS	Radium 226/228	Total Fe/Mn	Total Hg	Total Metals*
23020169-011	APW-04-WG-20230202	2/2/23; 1405	1	2		2										X	X	X	X	X	X	X	X
-012	APW-01R-WG-20230202	2/2/23; 1510	1	2		2																	
-013	EB-01-WQ-20230130	1/30/23; 0940	1	1		1																	
-014	DUP-01-WG-20230201	2/1/23; 0001	1	2		2																	
-015	DUP-02-WG-20230201	2/1/23; 0002	1	2		2																	

Relinquished By	Date/Time	Received By	Date/Time
Clay Sans	2/3/23; 0845		2/3/23 0845

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 77879

ANALYTICAL REPORT

February 23, 2023

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

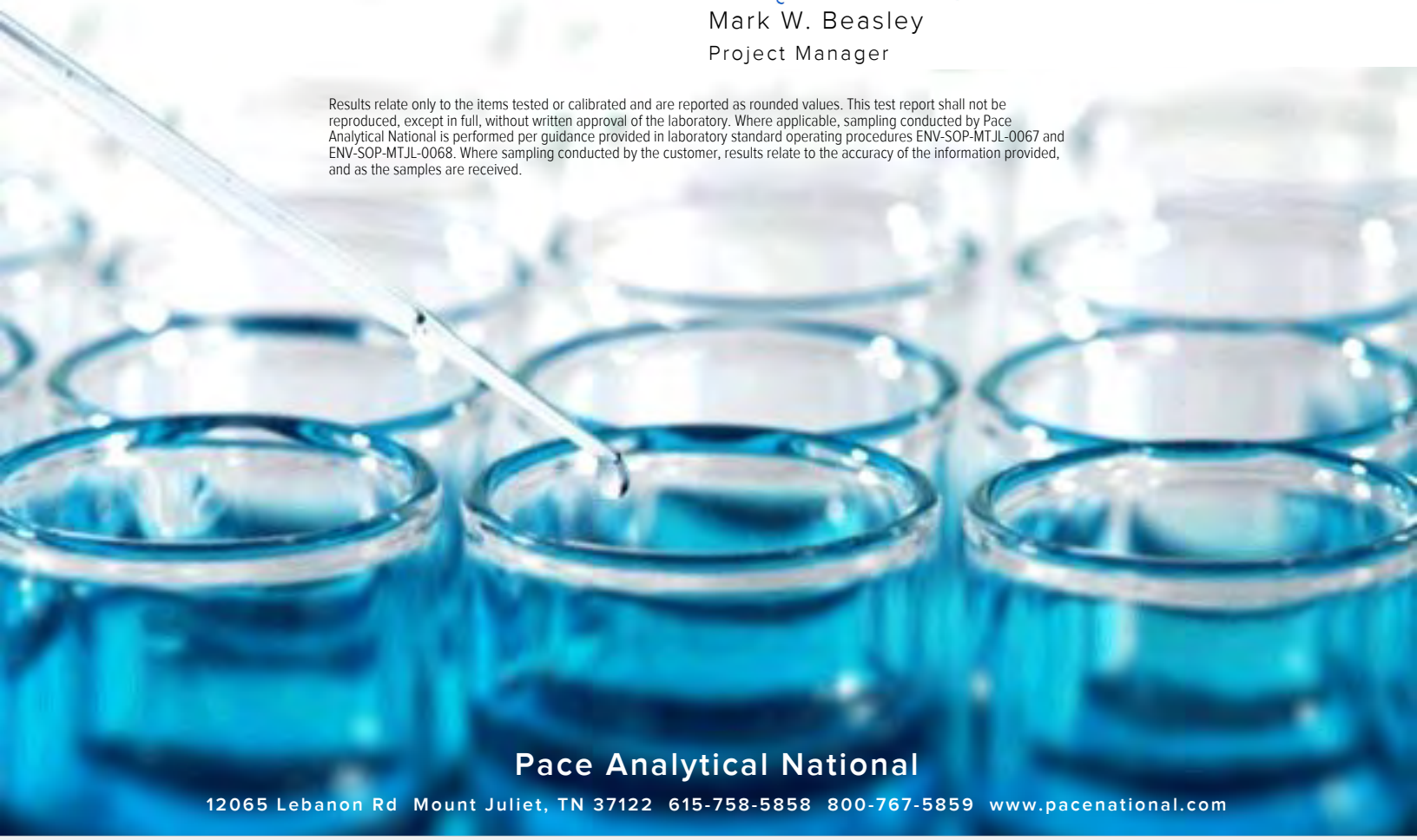
TEKLAB, Inc.

Sample Delivery Group:	L1582645
Samples Received:	02/06/2023
Project Number:	23020169
Description:	

Report To: Elizabeth Hurley
5445 Horseshoe Lake Road
Collinsville, IL 62234

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

23020169-001 L1582645-01 Non-Potable Water

Collected by	Collected date/time	Received date/time
	01/30/23 13:30	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004306	1	02/13/23 17:33	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-002 L1582645-02 Non-Potable Water

Collected by	Collected date/time	Received date/time
	01/30/23 14:45	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004306	1	02/13/23 17:33	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-003 L1582645-03 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/23 08:10	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004306	1	02/13/23 17:33	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-004 L1582645-04 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/23 11:00	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004306	1	02/13/23 17:33	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-005 L1582645-05 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/23 12:25	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004306	1	02/13/23 17:33	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-006 L1582645-06 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/23 13:50	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004306	1	02/13/23 17:33	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/16/23 16:43	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-007 L1582645-07 Non-Potable Water

Collected by | Collected date/time 02/01/23 15:50 | Received date/time 02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-008 L1582645-08 Non-Potable Water

Collected by | Collected date/time 02/01/23 09:45 | Received date/time 02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-009 L1582645-09 Non-Potable Water

Collected by | Collected date/time 02/01/23 11:10 | Received date/time 02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-010 L1582645-10 Non-Potable Water

Collected by | Collected date/time 02/01/23 12:30 | Received date/time 02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-011 L1582645-11 Non-Potable Water

Collected by | Collected date/time 02/01/23 14:05 | Received date/time 02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001731	1	02/08/23 13:09	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001731	1	02/08/23 13:09	02/10/23 10:57	RGT	Mt. Juliet, TN

23020169-012 L1582645-12 Non-Potable Water

Collected by | Collected date/time 02/01/23 15:10 | Received date/time 02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001734	1	02/09/23 14:52	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001734	1	02/09/23 14:52	02/16/23 10:25	RGT	Mt. Juliet, TN

23020169-013 L1582645-13 Non-Potable Water

Collected by	Collected date/time	Received date/time
	01/30/23 09:40	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001734	1	02/09/23 14:52	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001734	1	02/09/23 14:52	02/16/23 10:25	RGT	Mt. Juliet, TN

23020169-014 L1582645-14 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/23 00:01	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001734	1	02/09/23 14:52	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001734	1	02/09/23 14:52	02/16/23 10:25	RGT	Mt. Juliet, TN

23020169-015 L1582645-15 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/23 00:02	02/06/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2004309	1	02/16/23 18:01	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2001734	1	02/09/23 14:52	02/22/23 13:00	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2001734	1	02/09/23 14:52	02/16/23 10:25	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.119	U	0.430	0.749	02/16/2023 16:43	WG2004306
(T) Barium	*88.7*			*30.0-143*	*02/16/2023 16:43*	WG2004306
(T) Yttrium	*95.0*			*30.0-136*	*02/16/2023 16:43*	WG2004306

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.412	J	0.479	0.776	02/16/2023 16:43	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.293		0.212	0.202	02/10/2023 10:57	WG2001731
(T) Barium-133	*81.0*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.77		0.352	0.561	02/16/2023 16:43	WG2004306
(T) Barium	*108*			*30.0-143*	*02/16/2023 16:43*	WG2004306
(T) Yttrium	*98.1*			*30.0-136*	*02/16/2023 16:43*	WG2004306

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.10		0.441	0.638	02/16/2023 16:43	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.337		0.265	0.303	02/10/2023 10:57	WG2001731
(T) Barium-133	*84.2*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.44		0.518	0.862	02/16/2023 16:43	WG2004306
(T) Barium	*87.3*			*30.0-143*	*02/16/2023 16:43*	WG2004306
(T) Yttrium	*94.0*			*30.0-136*	*02/16/2023 16:43*	WG2004306

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.47		0.568	0.949	02/16/2023 16:43	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0283	U	0.232	0.397	02/10/2023 10:57	WG2001731
(T) Barium-133	*92.2*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.02		0.451	0.758	02/16/2023 16:43	WG2004306
(T) Barium	*101*			*30.0-143*	*02/16/2023 16:43*	WG2004306
(T) Yttrium	*91.9*			*30.0-136*	*02/16/2023 16:43*	WG2004306

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.38		0.528	0.822	02/16/2023 16:43	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.355		0.275	0.317	02/10/2023 10:57	WG2001731
(T) Barium-133	*104*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.399	J	0.422	0.723	02/16/2023 16:43	WG2004306
(T) Barium	*105*			*30.0-143*	*02/16/2023 16:43*	WG2004306
(T) Yttrium	*98.9*			*30.0-136*	*02/16/2023 16:43*	WG2004306

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.608	J	0.488	0.798	02/16/2023 16:43	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.209	J	0.245	0.338	02/10/2023 10:57	WG2001731
(T) Barium-133	*87.7*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.07		0.466	0.782	02/16/2023 16:43	WG2004306
(T) Barium	*94.3*			*30.0-143*	*02/16/2023 16:43*	WG2004306
(T) Yttrium	*97.3*			*30.0-136*	*02/16/2023 16:43*	WG2004306

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.14		0.532	0.890	02/16/2023 16:43	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0737	U	0.256	0.425	02/10/2023 10:57	WG2001731
(T) Barium-133	*90.3*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.0230	U	0.243	0.451	02/22/2023 13:00	WG2004309
(T) Barium	*97.5*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*95.3*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.120	U	0.289	0.512	02/22/2023 13:00	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0975	J	0.156	0.242	02/10/2023 10:57	WG2001731
(T) Barium-133	*95.2*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.157	U	0.282	0.525	02/22/2023 13:00	WG2004309
(T) Barium	*94.3*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*107*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.247	J	0.373	0.611	02/22/2023 13:00	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.247	J	0.244	0.312	02/10/2023 10:57	WG2001731
(T) Barium-133	*90.7*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.162	U	0.371	0.680	02/22/2023 13:00	WG2004309
(T) Barium	*91.8*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*107*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.24		0.542	0.732	02/22/2023 13:00	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.08		0.395	0.272	02/10/2023 10:57	WG2001731
(T) Barium-133	*93.8*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.847		0.370	0.661	02/22/2023 13:00	WG2004309
(T) Barium	*73.1*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*107*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.03		0.402	0.682	02/22/2023 13:00	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.186		0.157	0.168	02/10/2023 10:57	WG2001731
(T) Barium-133	*97.3*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.961		0.296	0.521	02/22/2023 13:00	WG2004309
(T) Barium	*95.1*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*103*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.31		0.376	0.568	02/22/2023 13:00	WG2001731

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.352		0.232	0.226	02/10/2023 10:57	WG2001731
(T) Barium-133	*97.4*			*30.0-143*	*02/10/2023 10:57*	WG2001731

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.531		0.284	0.511	02/22/2023 13:00	WG2004309
(T) Barium	*95.5*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*93.9*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.691		0.330	0.552	02/22/2023 13:00	WG2001734

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.160	J	0.169	0.210	02/16/2023 10:25	WG2001734
(T) Barium-133	*93.7*			*30.0-143*	*02/16/2023 10:25*	WG2001734

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.573	U	0.349	0.665	02/22/2023 13:00	WG2004309
(T) Barium	*82.2*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*88.2*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.0194	U	0.369	0.722	02/22/2023 13:00	WG2001734

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0194	U	0.120	0.281	02/16/2023 10:25	WG2001734
(T) Barium-133	*58.2*			*30.0-143*	*02/16/2023 10:25*	WG2001734

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.249	J	0.228	0.416	02/22/2023 13:00	WG2004309
(T) Barium	*93.0*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*102*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.454	J	0.332	0.532	02/22/2023 13:00	WG2001734

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.205	J	0.241	0.332	02/16/2023 10:25	WG2001734
(T) Barium-133	*76.9*			*30.0-143*	*02/16/2023 10:25*	WG2001734

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.981		0.290	0.506	02/22/2023 13:00	WG2004309
(T) Barium	*88.2*			*30.0-143*	*02/22/2023 13:00*	WG2004309
(T) Yttrium	*117*			*30.0-136*	*02/22/2023 13:00*	WG2004309

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.16		0.402	0.651	02/22/2023 13:00	WG2001734

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.175	J	0.279	0.409	02/16/2023 10:25	WG2001734
(T) Barium-133	*89.4*			*30.0-143*	*02/16/2023 10:25*	WG2001734

Method Blank (MB)

(MB) R3891876-1 02/16/23 16:43

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
Radium-228	0.288	J	0.202	0.345
(T) Barium	*105*		*105*	
(T) Yttrium	*101*		*101*	

L1582632-20 Original Sample (OS) • Duplicate (DUP)

(OS) L1582632-20 02/16/23 16:43 • (DUP) R3891876-5 02/16/23 16:43

Analyte	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	+ / -	pCi/l		%			%	
Radium-228	1.04	0.448	0.756	1.16	0.394	0.756	1	11.1	0.204		20	3
(T) Barium	*89.0*			*105*	*105*							
(T) Yttrium	*100*			*93.8*	*93.8*							

Laboratory Control Sample (LCS)

(LCS) R3891876-2 02/16/23 16:43

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-228	5.00	4.22	84.5	80.0-120	
(T) Barium			*106*		
(T) Yttrium			*108*		

L1583846-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1583846-01 02/16/23 16:43 • (MS) R3891876-3 02/16/23 16:43 • (MSD) R3891876-4 02/16/23 16:43

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	-0.811	6.43	6.66	64.3	66.6	1	70.0-130	J6	J6	3.39		20
(T) Barium		*99.2*			*98.5*	*108*							
(T) Yttrium		*102*			*98.3*	*102*							

Method Blank (MB)

(MB) R3894152-1 02/22/23 13:00

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.236	J	0.208	0.377
(T) Barium	*96.2*		*96.2*	
(T) Yttrium	*106*		*106*	

L1580085-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1580085-01 02/22/23 13:00 • (DUP) R3894152-5 02/22/23 13:00

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.20	0.415	0.734	0.653	0.353	0.734	1	59.1	1.01		20	3
(T) Barium	*92.3*			*93.1*	*93.1*							
(T) Yttrium	*99.0*			*102*	*102*							

Laboratory Control Sample (LCS)

(LCS) R3894152-2 02/22/23 13:00

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.17	83.5	80.0-120	
(T) Barium			*83.0*		
(T) Yttrium			*111*		

L1579058-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1579058-02 02/22/23 13:00 • (MS) R3894152-3 02/22/23 13:00 • (MSD) R3894152-4 02/22/23 13:00

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.153	9.11	8.76	89.6	86.1	1	70.0-130			3.87		20
(T) Barium		*98.6*			*101*	*102*							
(T) Yttrium		*96.1*			*103*	*105*							

Method Blank (MB)

(MB) R3891354-1 02/10/23 10:57

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
Radium-226	0.0221	U	0.0497	0.0810
(T) Barium-133	*91.0*		*91.0*	

L1582632-29 Original Sample (OS) • Duplicate (DUP)

(OS) L1582632-29 02/10/23 10:57 • (DUP) R3891354-5 02/10/23 10:57

Analyte	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	+ / -	pCi/l		%			%	
Radium-226	0.438	0.255	0.205	0.0630	0.219	0.205	1	150	1.12	U	20	3
(T) Barium-133	*96.4*			*85.5*	*85.5*							

Laboratory Control Sample (LCS)

(LCS) R3891354-2 02/10/23 10:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.03	100	80.0-120	
(T) Barium-133			*94.2*		

L1582632-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1582632-21 02/10/23 10:57 • (MS) R3891354-3 02/10/23 10:57 • (MSD) R3891354-4 02/10/23 10:57

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.0	0.219	18.6	18.8	91.9	93.0	1	75.0-125			1.18		20
(T) Barium-133		*94.6*			*96.6*	*92.7*							

Method Blank (MB)

(MB) R3893260-1 02/16/23 10:25

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
Radium-226	0.305		0.130	0.106
(T) Barium-133	*69.7*		*69.7*	

L1580251-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1580251-01 02/16/23 10:25 • (DUP) R3893260-5 02/16/23 10:25

Analyte	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	+ / -	pCi/l		%			%	
Radium-226	0.783	0.466	0.442	0.513	0.474	0.442	1	41.6	0.406	J	20	3
(T) Barium-133	*55.3*			*51.4*	*51.4*							

Laboratory Control Sample (LCS)

(LCS) R3893260-2 02/16/23 10:25

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.06	101	80.0-120	
(T) Barium-133			*75.5*		

L1582645-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1582645-12 02/16/23 10:25 • (MS) R3893260-3 02/16/23 10:25 • (MSD) R3893260-4 02/16/23 10:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.0	0.160	20.1	21.2	99.8	105	1	75.0-125			4.99		20
(T) Barium-133		*93.7*			*88.8*	*81.0*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Pg ___ of ___ A116

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: | Sampler: Joseph Riley/Adam Bridges | QC Level: 3

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 on your standard turn around time.
Samples collected from an IL site.
Batch QC is required for all analyses requested. EDD requested..

Project# 23020169

Contact: Elizabeth Hurley | Email: EHurley@TekLabInc.com
Requested Due Date: Standard TAT | Billing/PO: 33948 | Phone: (618) 344-1004

LF582645

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Any changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Ra226/228											
-01	23010169-001	1/30/23 1330	HNO3	Groundwater	☑											
-02	23010169-002	1/30/23 1445	HNO3	Groundwater	☑											
-03	23010169-003	2/1/23 0810	HNO3	Groundwater	☑											
-04	23010169-004	2/1/23 1100	HNO3	Groundwater	☑											
-05	23010169-005	2/1/23 1225	HNO3	Groundwater	☑											
-06	23010169-006	2/1/23 1350	HNO3	Groundwater	☑											
-07	23010169-007	2/1/23 1550	HNO3	Groundwater	☑											
-08	23010169-008	2/1/23 0945	HNO3	Groundwater	☑											
-09	23010169-009	2/1/23 1110	HNO3	Groundwater	☑											
-10	23010169-010	2/1/23 1230	HNO3	Groundwater	☑											
-11	23010169-011	2/1/23 1405	HNO3	Groundwater	☑											

*Relinquished By	Date/Time	Received By	Date/Time
[signature]	2/3/23 16:00	[signature] PACE	2-6-23 1000

Sample Receipt Checklist

		If Applicable	
COC Seal Present/Intact:	Y N		
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N		

NSAG
19.1+0=19.1

does not provide client/sampler information without proper authorization. and proprietary rights, ted by local, state or federal laws. (Teklab QAM Section 9.1, TNI V1 M2 Section 4.1.5 c)

6319 3615 8308

SubCocRevA
3/2/2016

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: | Sampler: Joseph Riley/Adam Bridges | QC Level: 3

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 on your standard turn around time.
Samples collected from an IL site.
Batch QC is required for all analyses requested. EDD requested..

Project# 23020169

Contact: Elizabeth Hurley | Email: EHurley@TekLabInc.com
Requested Due Date: Standard TAT | Billing/PO: 33948 | Phone: (618) 344-1004

L1582645

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Any changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Ra226/228												
-12	23020169-012	2/1/23 1510	HNO3	Groundwater	✔												
-13	23020169-013	1/30/23 0940	HNO3	Groundwater	✔												
-14	23020169-014	2/1/23 0001	HNO3	Groundwater	✔												
-15	23020169-015	2/1/23 0002	HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												
			HNO3	Groundwater	✔												

*Relinquished By	Date/Time	Received By	Date/Time
[signature]	2/3/23		

LF5626H5

Tracking Numbers Fed Ex	Temperature
6319 3615 8308	MSAG 20.4
8282	14.1
8319	26.1
8293	19.1

August 10, 2023

Matt Halley
ERM
1968 Craig Road
Suite 100
St. Louis, MO 63146
TEL: (314) 952-2760
FAX:

Illinois	100226
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: 0599247 **WorkOrder:** 23062071

Dear Matt Halley:

TEKLAB, INC received 15 samples on 6/28/2023 10:10:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

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

Sincerely,

Elizabeth A. Hurley
Director of Customer Service
(618)344-1004 ex 33
ehurley@teklabinc.com

Report Contents

Client: ERM
Client Project: 0599247

Work Order: 23062071
Report Date: 10-Aug-23

This reporting package includes the following:

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Abbr Definition

*	Analytes on report marked with an asterisk are not NELAP accredited
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
CRQL	A Client Requested Quantitation Limit is a reporting limit that varies according to customer request. The CRQL may not be less than the MDL.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilution factors.
DNI	Did not ignite
DUP	Laboratory duplicate is a replicate aliquot prepared under the same laboratory conditions and independently analyzed to obtain a measure of precision.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample is a sample matrix, free from the analytes of interest,spiked with verified known amounts of analytes and analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MBLK	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	"The method detection limit is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results."
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
NC	Data is not acceptable for compliance purposes
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions.
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TIC	Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
TNTC	Too numerous to count (> 200 CFU)

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Qualifiers

# -	Unknown hydrocarbon	B -	Analyte detected in associated Method Blank
C -	RL shown is a Client Requested Quantitation Limit	E -	Value above quantitation range
H -	Holding times exceeded	I -	Associated internal standard was outside method criteria
J -	Analyte detected below quantitation limits	M -	Manual Integration used to determine area response
ND -	Not Detected at the Reporting Limit	R -	RPD outside accepted recovery limits
S -	Spike Recovery outside recovery limits	T -	TIC(Tentatively identified compound)
X -	Value exceeds Maximum Contaminant Level		

Case Narrative

http://www.teklabinc.com/

Client: ERM
Client Project: 0599247

Work Order: 23062071
Report Date: 10-Aug-23

Cooler Receipt Temp: 4.0 °C

Radium analyses were performed by Summit Environmental Technologies, Inc. See attached report for results and QC.

This report was revised on August 10, 2023 per Alison Treglia's request. The reason for the revision is to update the Ra228 values for -005 and -009 from ND to negative values. Please replace report dated Augsut 8, 2023 with this report. EAH 8/10/23

Locations

Collinsville

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email jhriley@teklabinc.com

Springfield

Address 3920 Pintail Dr
Springfield, IL 62711-9415
Phone (217) 698-1004
Fax (217) 698-1005
Email KKlostermann@teklabinc.com

Kansas City

Address 8421 Nieman Road
Lenexa, KS 66214
Phone (913) 541-1998
Fax (913) 541-1998
Email jhriley@teklabinc.com

Collinsville Air

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email EHurley@teklabinc.com

Chicago

Address 1319 Butterfield Rd.
Downers Grove, IL 60515
Phone (630) 324-6855
Fax
Email arenner@teklabinc.com

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2024	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2024	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2023	Collinsville
Arkansas	ADEQ	88-0966		3/14/2024	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2024	Collinsville
Kentucky	UST	0073		1/31/2024	Collinsville
Missouri	MDNR	00930		5/31/2023	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-001 **Client Sample ID:** EB-01-WQ-20230626

Matrix: GROUNDWATER **Collection Date:** 06/26/2023 9:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**< 20**	mg/L	1	06/28/2023 15:02	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	07/03/2023 21:04	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**5.33**		1	06/29/2023 11:33	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**< 0.10**	mg/L	1	07/03/2023 12:15	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**< 4**	mg/L	1	07/03/2023 21:02	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	07/04/2023 0:04	207943
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Calcium	NELAP	0.125		**< 0.125**	mg/L	5	07/04/2023 0:04	207943
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 15:58	207943
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 15:58	207943
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Lithium	*	0.0030		**< 0.0030**	mg/L	5	07/06/2023 15:58	207943
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/04/2023 0:04	207943
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/04/2023 0:04	207943
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/04/2023 0:04	207943
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 3:47	208035
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:12	208035
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:12	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:12	208035
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	07/07/2023 3:12	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:12	208035
Calcium	NELAP	0.125	B	**< 0.125**	mg/L	5	07/07/2023 3:12	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 3:12	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:12	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 3:47	208035
Lithium	*	0.0030		**< 0.0030**	mg/L	5	07/07/2023 3:12	208035
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 3:12	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:12	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/06/2023 3:47	208035
Contamination present in the MBLK for Ca. Sample results below the reporting limit are reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/05/2023 9:10	207990
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-002 **Client Sample ID:** APW-03-WG-20230626

Matrix: GROUNDWATER **Collection Date:** 06/26/2023 12:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**614**	mg/L	1	06/28/2023 15:03	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**292**	mg/L	10	07/03/2023 21:24	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.77**		1	06/29/2023 11:37	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.23**	mg/L	1	07/03/2023 12:17	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**17**	mg/L	1	07/03/2023 21:13	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:03	207896
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	06/29/2023 17:43	207896
Barium	NELAP	0.0010		**0.130**	mg/L	5	07/03/2023 16:03	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:03	207896
Boron	NELAP	0.0250		**4.64**	mg/L	5	07/03/2023 16:03	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:03	207896
Calcium	NELAP	0.125		**125**	mg/L	5	07/03/2023 16:03	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 5:26	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 5:26	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:03	207896
Lithium	*	0.0030		**0.0262**	mg/L	5	06/29/2023 17:43	207896
Molybdenum	NELAP	0.0015		**0.0656**	mg/L	5	07/03/2023 16:03	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 17:43	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 16:03	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 3:54	208035
Arsenic	NELAP	0.0010		**0.0040**	mg/L	5	07/07/2023 3:18	208035
Barium	NELAP	0.0010		**0.155**	mg/L	5	07/07/2023 3:18	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:18	208035
Boron	NELAP	0.0250		**4.67**	mg/L	5	07/07/2023 3:18	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:18	208035
Calcium	NELAP	0.125	B	**139**	mg/L	5	07/07/2023 3:18	208035
Chromium	NELAP	0.0015		**0.0241**	mg/L	5	07/07/2023 3:18	208035
Cobalt	NELAP	0.0010		**0.0014**	mg/L	5	07/07/2023 3:18	208035
Lead	NELAP	0.0010		**0.0044**	mg/L	5	07/06/2023 3:54	208035
Lithium	*	0.0030		**0.0352**	mg/L	5	07/07/2023 3:18	208035
Molybdenum	NELAP	0.0015		**0.0553**	mg/L	5	07/07/2023 3:18	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 3:18	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/06/2023 3:54	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/05/2023 9:17	207990
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-003 **Client Sample ID:** APW-08-WG-20230626

Matrix: GROUNDWATER **Collection Date:** 06/26/2023 14:15

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**420**	mg/L	2.5	06/28/2023 15:03	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**31**	mg/L	1	07/03/2023 21:47	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.18**		1	06/29/2023 11:40	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.26**	mg/L	1	07/03/2023 12:20	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**10**	mg/L	1	07/03/2023 21:48	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:09	207896
Arsenic	NELAP	0.0010		**0.0010**	mg/L	5	06/29/2023 17:50	207896
Barium	NELAP	0.0010		**0.191**	mg/L	5	07/03/2023 16:09	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:09	207896
Boron	NELAP	0.0250		**0.124**	mg/L	5	07/03/2023 16:09	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:09	207896
Calcium	NELAP	0.125		**92.6**	mg/L	5	07/03/2023 16:09	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 5:32	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 5:32	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:09	207896
Lithium	*	0.0030		**0.0125**	mg/L	5	06/29/2023 17:50	207896
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/03/2023 16:09	207896
Selenium	NELAP	0.0010		**0.0113**	mg/L	5	06/29/2023 17:50	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 16:09	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 4:00	208035
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	07/07/2023 4:09	208035
Barium	NELAP	0.0010		**0.225**	mg/L	5	07/07/2023 4:09	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:09	208035
Boron	NELAP	0.0250		**0.103**	mg/L	5	07/07/2023 4:09	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:09	208035
Calcium	NELAP	0.125	B	**99.4**	mg/L	5	07/07/2023 4:09	208035
Chromium	NELAP	0.0015		**0.0082**	mg/L	5	07/07/2023 4:09	208035
Cobalt	NELAP	0.0010		**0.0019**	mg/L	5	07/07/2023 4:09	208035
Lead	NELAP	0.0010		**0.0028**	mg/L	5	07/07/2023 4:09	208035
Lithium	*	0.0030		**0.0157**	mg/L	5	07/07/2023 4:09	208035
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 4:09	208035
Selenium	NELAP	0.0010		**0.0129**	mg/L	5	07/07/2023 4:09	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/06/2023 4:00	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/05/2023 9:19	207990
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-004 **Client Sample ID:** APW-07-WG-20230626

Matrix: GROUNDWATER **Collection Date:** 06/26/2023 15:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**665**	mg/L	2.5	06/28/2023 15:03	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	20		**54**	mg/L	2	07/06/2023 13:28	R331244
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.79**		1	06/29/2023 11:42	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.17**	mg/L	1	07/03/2023 12:21	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**10**	mg/L	1	07/03/2023 21:56	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:33	207896
Arsenic	NELAP	0.0010		**0.0012**	mg/L	5	06/29/2023 18:15	207896
Barium	NELAP	0.0010		**0.303**	mg/L	5	07/03/2023 16:33	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:33	207896
Boron	NELAP	0.0250		**0.208**	mg/L	5	07/03/2023 16:33	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:33	207896
Calcium	NELAP	0.125	S	**180**	mg/L	5	07/03/2023 16:33	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 5:56	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 5:56	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:33	207896
Lithium	*	0.0030		**0.0136**	mg/L	5	06/29/2023 18:15	207896
Molybdenum	NELAP	0.0015		**0.0027**	mg/L	5	07/03/2023 16:33	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 18:15	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 16:33	207896
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:53	208035
Arsenic	NELAP	0.0010		**0.0014**	mg/L	5	07/07/2023 4:53	208035
Barium	NELAP	0.0010		**0.312**	mg/L	5	07/07/2023 4:53	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:53	208035
Boron	NELAP	0.0250		**0.237**	mg/L	5	07/07/2023 4:53	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:53	208035
Calcium	NELAP	0.125	BS	**183**	mg/L	5	07/07/2023 4:53	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 4:53	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:53	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:53	208035
Lithium	*	0.0030		**0.0153**	mg/L	5	07/07/2023 4:53	208035
Molybdenum	NELAP	0.0015		**0.0028**	mg/L	5	07/07/2023 4:53	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:53	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 4:53	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/05/2023 9:21	207990
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662

Client: ERM
Work Order: 23062071
Client Project: 0599247
Report Date: 10-Aug-23
Lab ID: 23062071-004
Client Sample ID: APW-07-WG-20230626
Matrix: GROUNDWATER
Collection Date: 06/26/2023 15:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903.0/904.0, RADIUM 226/228								
Radium-228	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-005 **Client Sample ID:** APW-10S-WG-20230626

Matrix: GROUNDWATER **Collection Date:** 06/26/2023 17:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**725**	mg/L	2.5	06/28/2023 15:05	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	07/03/2023 22:03	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.01**		1	06/29/2023 11:45	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.15**	mg/L	1	07/03/2023 12:23	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**14**	mg/L	1	07/03/2023 22:04	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:15	207896
Arsenic	NELAP	0.0010		**0.166**	mg/L	5	06/29/2023 17:56	207896
Barium	NELAP	0.0010		**0.506**	mg/L	5	07/03/2023 16:15	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:15	207896
Boron	NELAP	0.0250		**0.578**	mg/L	5	07/03/2023 16:15	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:15	207896
Calcium	NELAP	0.125		**142**	mg/L	5	07/03/2023 16:15	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 5:38	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 5:38	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:15	207896
Lithium	*	0.0030		**0.0278**	mg/L	5	06/29/2023 17:56	207896
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/03/2023 16:15	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 17:56	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 16:15	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 4:06	208035
Arsenic	NELAP	0.0010		**0.194**	mg/L	5	07/07/2023 4:15	208035
Barium	NELAP	0.0010		**0.589**	mg/L	5	07/07/2023 4:15	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:15	208035
Boron	NELAP	0.0250		**0.582**	mg/L	5	07/07/2023 4:15	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:15	208035
Calcium	NELAP	0.125	B	**153**	mg/L	5	07/07/2023 4:15	208035
Chromium	NELAP	0.0015		**0.0025**	mg/L	5	07/07/2023 4:15	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:15	208035
Lead	NELAP	0.0010		**0.0016**	mg/L	5	07/06/2023 4:06	208035
Lithium	*	0.0030		**0.0291**	mg/L	5	07/07/2023 4:15	208035
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 4:15	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:15	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/06/2023 4:06	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/05/2023 9:23	207990
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-006 **Client Sample ID:** APW-10D-WG-20230626

Matrix: GROUNDWATER **Collection Date:** 06/26/2023 18:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**485**	mg/L	2.5	06/28/2023 15:21	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**44**	mg/L	1	07/03/2023 22:11	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.98**		1	06/29/2023 11:49	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.11**	mg/L	1	07/03/2023 12:43	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**14**	mg/L	1	07/03/2023 22:12	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:21	207896
Arsenic	NELAP	0.0010		**0.0011**	mg/L	5	06/29/2023 18:02	207896
Barium	NELAP	0.0010		**0.348**	mg/L	5	07/03/2023 16:21	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:21	207896
Boron	NELAP	0.0250		**0.0704**	mg/L	5	07/03/2023 16:21	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:21	207896
Calcium	NELAP	0.125		**114**	mg/L	5	07/03/2023 16:21	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 5:44	207896
Cobalt	NELAP	0.0010		**0.0026**	mg/L	5	07/06/2023 5:44	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:21	207896
Lithium	*	0.0030		**0.0148**	mg/L	5	06/29/2023 18:02	207896
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/03/2023 16:21	207896
Selenium	NELAP	0.0010		**0.0013**	mg/L	5	06/29/2023 18:02	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 16:21	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:22	208035
Arsenic	NELAP	0.0010		**0.0019**	mg/L	5	07/07/2023 4:22	208035
Barium	NELAP	0.0010		**0.485**	mg/L	5	07/07/2023 4:22	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:22	208035
Boron	NELAP	0.0250		**0.0674**	mg/L	5	07/07/2023 4:22	208035
Cadmium	NELAP	0.0010		**0.0011**	mg/L	5	07/07/2023 4:22	208035
Calcium	NELAP	0.125	B	**611**	mg/L	5	07/07/2023 4:22	208035
Chromium	NELAP	0.0015		**0.0015**	mg/L	5	07/07/2023 4:22	208035
Cobalt	NELAP	0.0010		**0.0070**	mg/L	5	07/07/2023 4:22	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:22	208035
Lithium	*	0.0030		**0.0158**	mg/L	5	07/07/2023 4:22	208035
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 4:22	208035
Selenium	NELAP	0.0010		**0.0016**	mg/L	5	07/07/2023 4:22	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 4:22	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/05/2023 9:30	207990
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-007 **Client Sample ID:** APW-06S-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 9:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**615**	mg/L	2.5	06/28/2023 15:21	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**208**	mg/L	10	07/03/2023 22:25	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.05**		1	06/29/2023 11:51	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.26**	mg/L	1	07/03/2023 12:45	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**23**	mg/L	1	07/03/2023 22:20	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:27	207896
Arsenic	NELAP	0.0010		**0.0010**	mg/L	5	06/29/2023 18:08	207896
Barium	NELAP	0.0010		**0.210**	mg/L	5	07/03/2023 16:27	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:27	207896
Boron	NELAP	0.0250		**5.83**	mg/L	5	07/03/2023 16:27	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:27	207896
Calcium	NELAP	0.125		**100**	mg/L	5	07/03/2023 16:27	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 5:50	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 5:50	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 16:27	207896
Lithium	*	0.0030		**0.0411**	mg/L	5	06/29/2023 18:08	207896
Molybdenum	NELAP	0.0015		**0.232**	mg/L	5	07/03/2023 16:27	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 18:08	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 16:27	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Barium	NELAP	0.0010		**0.224**	mg/L	5	07/07/2023 4:28	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Boron	NELAP	0.0250		**5.84**	mg/L	5	07/07/2023 4:28	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Calcium	NELAP	0.125	B	**109**	mg/L	5	07/07/2023 4:28	208035
Chromium	NELAP	0.0015		**0.0019**	mg/L	5	07/07/2023 4:28	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Lithium	*	0.0030		**0.0412**	mg/L	5	07/07/2023 4:28	208035
Molybdenum	NELAP	0.0015		**0.235**	mg/L	5	07/07/2023 4:28	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:28	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 4:28	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 8:37	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/17/2023 15:33	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-008 **Client Sample ID:** APW-06D-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 10:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**735**	mg/L	2.5	06/28/2023 15:21	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**270**	mg/L	10	07/03/2023 22:49	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.39**		1	06/29/2023 11:54	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.20**	mg/L	1	07/03/2023 12:47	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**15**	mg/L	1	07/03/2023 22:44	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:16	207896
Arsenic	NELAP	0.0010		**0.0102**	mg/L	5	06/29/2023 18:59	207896
Barium	NELAP	0.0010		**0.130**	mg/L	5	07/03/2023 17:16	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:16	207896
Boron	NELAP	0.0250		**5.01**	mg/L	5	07/03/2023 17:16	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:16	207896
Calcium	NELAP	0.125		**118**	mg/L	5	07/03/2023 17:16	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 6:39	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 6:39	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:16	207896
Lithium	*	0.0030		**0.0160**	mg/L	5	06/29/2023 18:59	207896
Molybdenum	NELAP	0.0015		**0.0643**	mg/L	5	07/03/2023 17:16	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 18:59	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:16	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:34	208035
Arsenic	NELAP	0.0010		**0.0115**	mg/L	5	07/07/2023 4:34	208035
Barium	NELAP	0.0010		**0.145**	mg/L	5	07/07/2023 4:34	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:34	208035
Boron	NELAP	0.0250		**4.99**	mg/L	5	07/07/2023 4:34	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:34	208035
Calcium	NELAP	0.125	B	**128**	mg/L	5	07/07/2023 4:34	208035
Chromium	NELAP	0.0015		**0.0057**	mg/L	5	07/07/2023 4:34	208035
Cobalt	NELAP	0.0010		**0.0054**	mg/L	5	07/07/2023 4:34	208035
Lead	NELAP	0.0010		**0.0016**	mg/L	5	07/07/2023 4:34	208035
Lithium	*	0.0030		**0.0184**	mg/L	5	07/07/2023 4:34	208035
Molybdenum	NELAP	0.0015		**0.0602**	mg/L	5	07/07/2023 4:34	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:34	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 4:34	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 8:39	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-009 **Client Sample ID:** APW-02-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 12:15

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**920**	mg/L	2.5	06/28/2023 15:21	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**500**	mg/L	10	07/03/2023 22:57	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.90**		1	06/29/2023 12:00	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.22**	mg/L	1	07/03/2023 12:49	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**7**	mg/L	1	07/03/2023 22:52	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:22	207896
Arsenic	NELAP	0.0010		**0.0110**	mg/L	5	06/29/2023 19:05	207896
Barium	NELAP	0.0010		**0.142**	mg/L	5	07/03/2023 17:22	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:22	207896
Boron	NELAP	0.0250		**8.97**	mg/L	5	07/03/2023 17:22	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:22	207896
Calcium	NELAP	0.125		**147**	mg/L	5	07/03/2023 17:22	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 6:45	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 6:45	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:22	207896
Lithium	*	0.0030		**0.0442**	mg/L	5	06/29/2023 19:05	207896
Molybdenum	NELAP	0.0015		**0.227**	mg/L	5	07/03/2023 17:22	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 19:05	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:22	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:41	208035
Arsenic	NELAP	0.0010		**0.0148**	mg/L	5	07/07/2023 4:41	208035
Barium	NELAP	0.0010		**0.149**	mg/L	5	07/07/2023 4:41	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:41	208035
Boron	NELAP	0.0250		**9.14**	mg/L	5	07/07/2023 4:41	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:41	208035
Calcium	NELAP	0.125	B	**161**	mg/L	5	07/07/2023 4:41	208035
Chromium	NELAP	0.0015		**0.0024**	mg/L	5	07/07/2023 4:41	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:41	208035
Lead	NELAP	0.0010		**0.0025**	mg/L	5	07/07/2023 4:41	208035
Lithium	*	0.0030		**0.0459**	mg/L	5	07/07/2023 4:41	208035
Molybdenum	NELAP	0.0015		**0.229**	mg/L	5	07/07/2023 4:41	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:41	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 4:41	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 8:46	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/18/2023 9:09	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-010 **Client Sample ID:** APW-05R-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 14:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**740**	mg/L	2.5	06/28/2023 15:22	R330972
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**335**	mg/L	10	07/03/2023 23:06	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.27**		1	06/29/2023 12:03	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.30**	mg/L	1	07/03/2023 12:55	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**17**	mg/L	1	07/03/2023 23:00	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:28	207896
Arsenic	NELAP	0.0010		**0.0024**	mg/L	5	06/29/2023 19:11	207896
Barium	NELAP	0.0010		**0.168**	mg/L	5	07/03/2023 17:28	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:28	207896
Boron	NELAP	0.0250		**8.64**	mg/L	5	07/03/2023 17:28	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:28	207896
Calcium	NELAP	0.125		**120**	mg/L	5	07/03/2023 17:28	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 6:51	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 6:51	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:28	207896
Lithium	*	0.0030		**0.0384**	mg/L	5	06/29/2023 19:11	207896
Molybdenum	NELAP	0.0015		**0.213**	mg/L	5	07/03/2023 17:28	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 19:11	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:28	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:47	208035
Arsenic	NELAP	0.0010		**0.0030**	mg/L	5	07/07/2023 4:47	208035
Barium	NELAP	0.0010		**0.183**	mg/L	5	07/07/2023 4:47	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:47	208035
Boron	NELAP	0.0250		**8.76**	mg/L	5	07/07/2023 4:47	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:47	208035
Calcium	NELAP	0.125	B	**136**	mg/L	5	07/07/2023 4:47	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 4:47	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:47	208035
Lead	NELAP	0.0010		**0.0011**	mg/L	5	07/07/2023 4:47	208035
Lithium	*	0.0030		**0.0423**	mg/L	5	07/07/2023 4:47	208035
Molybdenum	NELAP	0.0015		**0.212**	mg/L	5	07/07/2023 4:47	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 4:47	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 4:47	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 8:48	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-011 **Client Sample ID:** APW-09-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 15:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**386**	mg/L	1	06/29/2023 11:35	R331052
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**47**	mg/L	1	07/03/2023 23:07	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.32**		1	06/29/2023 14:43	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.19**	mg/L	1	07/03/2023 12:57	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**12**	mg/L	1	07/03/2023 23:08	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:59	207896
Arsenic	NELAP	0.0010		**0.0021**	mg/L	5	06/29/2023 19:43	207896
Barium	NELAP	0.0010		**0.116**	mg/L	5	07/03/2023 17:59	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:59	207896
Boron	NELAP	0.0250		**0.572**	mg/L	5	07/06/2023 7:21	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:59	207896
Calcium	NELAP	0.125	S	**82.8**	mg/L	5	07/03/2023 17:59	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 7:21	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 7:21	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:59	207896
Lithium	*	0.0030		**0.0163**	mg/L	5	06/29/2023 19:43	207896
Molybdenum	NELAP	0.0015		**0.0211**	mg/L	5	07/03/2023 17:59	207896
Selenium	NELAP	0.0010		**0.0186**	mg/L	5	06/29/2023 19:43	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:59	207896
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**0.0010**	mg/L	5	07/07/2023 5:57	208035
Arsenic	NELAP	0.0010		**0.0021**	mg/L	5	07/07/2023 5:57	208035
Barium	NELAP	0.0010		**0.123**	mg/L	5	07/07/2023 5:57	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 5:57	208035
Boron	NELAP	0.0250		**0.473**	mg/L	5	07/07/2023 5:57	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 5:57	208035
Calcium	NELAP	0.125	B	**86.9**	mg/L	5	07/07/2023 5:57	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 5:57	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 5:57	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 5:57	208035
Lithium	*	0.0030		**0.0157**	mg/L	5	07/07/2023 5:57	208035
Molybdenum	NELAP	0.0015		**0.0189**	mg/L	5	07/07/2023 5:57	208035
Selenium	NELAP	0.0010		**0.0198**	mg/L	5	07/07/2023 5:57	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 5:57	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 8:51	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-012 **Client Sample ID:** APW-01R-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 16:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**328**	mg/L	1	06/29/2023 11:35	R331052
SW-846 9036 (TOTAL)								
Sulfate	NELAP	20		**37**	mg/L	2	07/06/2023 13:39	R331244
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.53**		1	06/29/2023 14:46	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.14**	mg/L	1	07/03/2023 12:51	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**< 4**	mg/L	1	07/03/2023 23:18	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:34	207896
Arsenic	NELAP	0.0010		**0.0011**	mg/L	5	06/29/2023 19:18	207896
Barium	NELAP	0.0010		**0.164**	mg/L	5	07/03/2023 17:34	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:34	207896
Boron	NELAP	0.0250		**0.249**	mg/L	5	07/03/2023 17:34	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:34	207896
Calcium	NELAP	0.125		**66.4**	mg/L	5	07/03/2023 17:34	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 6:57	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 6:57	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:34	207896
Lithium	*	0.0030		**0.0150**	mg/L	5	06/29/2023 19:18	207896
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/03/2023 17:34	207896
Selenium	NELAP	0.0010		**0.0032**	mg/L	5	06/29/2023 19:18	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:34	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:03	208035
Arsenic	NELAP	0.0010		**0.0013**	mg/L	5	07/07/2023 6:03	208035
Barium	NELAP	0.0010		**0.168**	mg/L	5	07/07/2023 6:03	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:03	208035
Boron	NELAP	0.0250		**0.176**	mg/L	5	07/07/2023 6:03	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:03	208035
Calcium	NELAP	0.125	B	**66.8**	mg/L	5	07/07/2023 6:03	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 6:03	208035
Cobalt	NELAP	0.0010		**0.0014**	mg/L	5	07/07/2023 6:03	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:03	208035
Lithium	*	0.0030		**0.0142**	mg/L	5	07/07/2023 6:03	208035
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 6:03	208035
Selenium	NELAP	0.0010		**0.0033**	mg/L	5	07/07/2023 6:03	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 6:03	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 8:53	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-013 **Client Sample ID:** APW-04-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 17:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**432**	mg/L	1	06/29/2023 11:35	R331052
SW-846 9036 (TOTAL)								
Sulfate	NELAP	20		**65**	mg/L	2	07/06/2023 14:12	R331244
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.39**		1	06/29/2023 14:50	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.16**	mg/L	1	07/03/2023 12:53	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**12**	mg/L	1	07/03/2023 23:56	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:41	207896
Arsenic	NELAP	0.0010		**0.0014**	mg/L	5	06/29/2023 19:24	207896
Barium	NELAP	0.0010		**0.122**	mg/L	5	07/03/2023 17:41	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:41	207896
Boron	NELAP	0.0250		**0.908**	mg/L	5	07/03/2023 17:41	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:41	207896
Calcium	NELAP	0.125		**88.3**	mg/L	5	07/03/2023 17:41	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 7:03	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 7:03	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:41	207896
Lithium	*	0.0030		**0.0311**	mg/L	5	06/29/2023 19:24	207896
Molybdenum	NELAP	0.0015		**0.0503**	mg/L	5	07/03/2023 17:41	207896
Selenium	NELAP	0.0010		**0.0165**	mg/L	5	06/29/2023 19:24	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:41	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:10	208035
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	07/07/2023 6:10	208035
Barium	NELAP	0.0010		**0.138**	mg/L	5	07/07/2023 6:10	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:10	208035
Boron	NELAP	0.0250		**0.876**	mg/L	5	07/07/2023 6:10	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:10	208035
Calcium	NELAP	0.125	B	**97.5**	mg/L	5	07/07/2023 6:10	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 6:10	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:10	208035
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:10	208035
Lithium	*	0.0030		**0.0314**	mg/L	5	07/07/2023 6:10	208035
Molybdenum	NELAP	0.0015		**0.0449**	mg/L	5	07/07/2023 6:10	208035
Selenium	NELAP	0.0010		**0.0165**	mg/L	5	07/07/2023 6:10	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 6:10	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 9:00	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-014 **Client Sample ID:** DUP-01-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 0:01

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**695**	mg/L	2.5	06/29/2023 11:36	R331052
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**326**	mg/L	10	07/04/2023 0:09	R331147
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.30**		1	06/29/2023 14:53	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.32**	mg/L	1	07/03/2023 13:07	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**18**	mg/L	1	07/04/2023 0:04	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:47	207896
Arsenic	NELAP	0.0010		**0.0025**	mg/L	5	06/29/2023 19:30	207896
Barium	NELAP	0.0010		**0.167**	mg/L	5	07/03/2023 17:47	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:47	207896
Boron	NELAP	0.0250		**8.37**	mg/L	5	07/03/2023 17:47	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:47	207896
Calcium	NELAP	0.125		**120**	mg/L	5	07/03/2023 17:47	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 7:09	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 7:09	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:47	207896
Lithium	*	0.0030		**0.0398**	mg/L	5	06/29/2023 19:30	207896
Molybdenum	NELAP	0.0015		**0.204**	mg/L	5	07/03/2023 17:47	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 19:30	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:47	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:16	208035
Arsenic	NELAP	0.0010		**0.0030**	mg/L	5	07/07/2023 6:16	208035
Barium	NELAP	0.0010		**0.181**	mg/L	5	07/07/2023 6:16	208035
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:16	208035
Boron	NELAP	0.0250		**8.68**	mg/L	5	07/07/2023 6:16	208035
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:16	208035
Calcium	NELAP	0.125	B	**133**	mg/L	5	07/07/2023 6:16	208035
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/07/2023 6:16	208035
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:16	208035
Lead	NELAP	0.0010		**0.0010**	mg/L	5	07/07/2023 6:16	208035
Lithium	*	0.0030		**0.0415**	mg/L	5	07/07/2023 6:16	208035
Molybdenum	NELAP	0.0015		**0.210**	mg/L	5	07/07/2023 6:16	208035
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/07/2023 6:16	208035
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/07/2023 6:16	208035
Sample result for Ca exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 9:02	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Lab ID: 23062071-015 **Client Sample ID:** DUP-02-WG-20230627

Matrix: GROUNDWATER **Collection Date:** 06/27/2023 0:02

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**870**	mg/L	2.5	06/29/2023 11:36	R331052
SW-846 9036 (TOTAL)								
Sulfate	NELAP	200		**465**	mg/L	20	07/06/2023 14:20	R331244
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.03**		1	06/29/2023 14:56	R330948
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.22**	mg/L	1	07/03/2023 13:09	R331110
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**8**	mg/L	1	07/04/2023 0:12	R331159
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:53	207896
Arsenic	NELAP	0.0010		**0.0107**	mg/L	5	06/29/2023 19:36	207896
Barium	NELAP	0.0010		**0.145**	mg/L	5	07/03/2023 17:53	207896
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:53	207896
Boron	NELAP	0.0250		**9.24**	mg/L	5	07/03/2023 17:53	207896
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:53	207896
Calcium	NELAP	0.125		**148**	mg/L	5	07/03/2023 17:53	207896
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	07/06/2023 7:15	207896
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 7:15	207896
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	07/03/2023 17:53	207896
Lithium	*	0.0030		**0.0455**	mg/L	5	06/29/2023 19:36	207896
Molybdenum	NELAP	0.0015		**0.227**	mg/L	5	07/03/2023 17:53	207896
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	06/29/2023 19:36	207896
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/03/2023 17:53	207896
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 22:13	208048
Arsenic	NELAP	0.0010		**0.0146**	mg/L	5	07/05/2023 22:45	208048
Barium	NELAP	0.0010		**0.206**	mg/L	5	07/06/2023 22:13	208048
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/06/2023 22:13	208048
Boron	NELAP	0.0250	S	**9.51**	mg/L	5	07/06/2023 22:13	208048
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/05/2023 22:45	208048
Calcium	NELAP	0.125	S	**167**	mg/L	5	07/06/2023 22:13	208048
Chromium	NELAP	0.0015		**0.0079**	mg/L	5	07/05/2023 22:45	208048
Cobalt	NELAP	0.0010		**0.0016**	mg/L	5	07/05/2023 22:45	208048
Lead	NELAP	0.0010		**0.0029**	mg/L	5	07/05/2023 22:45	208048
Lithium	*	0.0030		**0.0480**	mg/L	5	07/06/2023 22:13	208048
Molybdenum	NELAP	0.0015		**0.252**	mg/L	5	07/06/2023 22:13	208048
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	07/05/2023 22:45	208048
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	07/05/2023 22:45	208048
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	07/06/2023 9:04	208092
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662
Radium-228	*	0		**See Attached**	pci/L	1	07/20/2023 15:16	R334662

Client: ERM
Client Project: 0599247

Work Order: 23062071
Report Date: 10-Aug-23

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
23062071-001	EB-01-WQ-20230626	Groundwater	4	06/26/2023 9:00
23062071-002	APW-03-WG-20230626	Groundwater	4	06/26/2023 12:10
23062071-003	APW-08-WG-20230626	Groundwater	4	06/26/2023 14:15
23062071-004	APW-07-WG-20230626	Groundwater	4	06/26/2023 15:20
23062071-005	APW-10S-WG-20230626	Groundwater	4	06/26/2023 17:00
23062071-006	APW-10D-WG-20230626	Groundwater	4	06/26/2023 18:45
23062071-007	APW-06S-WG-20230627	Groundwater	4	06/27/2023 9:10
23062071-008	APW-06D-WG-20230627	Groundwater	4	06/27/2023 10:35
23062071-009	APW-02-WG-20230627	Groundwater	4	06/27/2023 12:15
23062071-010	APW-05R-WG-20230627	Groundwater	4	06/27/2023 14:10
23062071-011	APW-09-WG-20230627	Groundwater	4	06/27/2023 15:20
23062071-012	APW-01R-WG-20230627	Groundwater	4	06/27/2023 16:30
23062071-013	APW-04-WG-20230627	Groundwater	4	06/27/2023 17:35
23062071-014	DUP-01-WG-20230627	Groundwater	4	06/27/2023 0:01
23062071-015	DUP-02-WG-20230627	Groundwater	4	06/27/2023 0:02

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23062071-001A	EB-01-WQ-20230626	06/26/2023 9:00	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:02
	SW-846 9036 (Total)				07/03/2023 21:04
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:33
	SW-846 9214 (Total)				07/03/2023 12:15
	SW-846 9251 (Total)				07/03/2023 21:02
23062071-001B	EB-01-WQ-20230626	06/26/2023 9:00	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/17/2023 15:33
23062071-001C	EB-01-WQ-20230626	06/26/2023 9:00	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/06/2023 3:47
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 3:12
	SW-846 7470A (Total)			06/30/2023 14:49	07/05/2023 9:10
23062071-001D	EB-01-WQ-20230626	06/26/2023 9:00	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/30/2023 10:09	07/04/2023 0:04
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/30/2023 10:09	07/06/2023 15:58
23062071-002A	APW-03-WG-20230626	06/26/2023 12:10	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:03
	SW-846 9036 (Total)				07/03/2023 21:24
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:37
	SW-846 9214 (Total)				07/03/2023 12:17
	SW-846 9251 (Total)				07/03/2023 21:13
23062071-002B	APW-03-WG-20230626	06/26/2023 12:10	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/18/2023 9:09
23062071-002C	APW-03-WG-20230626	06/26/2023 12:10	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/06/2023 3:54
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 3:18
	SW-846 7470A (Total)			06/30/2023 14:49	07/05/2023 9:17
23062071-002D	APW-03-WG-20230626	06/26/2023 12:10	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 17:43
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 16:03
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 5:26
23062071-003A	APW-08-WG-20230626	06/26/2023 14:15	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:03
	SW-846 9036 (Total)				07/03/2023 21:47
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:40
	SW-846 9214 (Total)				07/03/2023 12:20

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
	SW-846 9251 (Total)				07/03/2023 21:48
23062071-003B	APW-08-WG-20230626	06/26/2023 14:15	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/17/2023 15:33
23062071-003C	APW-08-WG-20230626	06/26/2023 14:15	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/06/2023 4:00
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:09
	SW-846 7470A (Total)			06/30/2023 14:49	07/05/2023 9:19
23062071-003D	APW-08-WG-20230626	06/26/2023 14:15	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 17:50
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 16:09
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 5:32
23062071-004A	APW-07-WG-20230626	06/26/2023 15:20	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:03
	SW-846 9036 (Total)				07/06/2023 13:28
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:42
	SW-846 9214 (Total)				07/03/2023 12:21
	SW-846 9251 (Total)				07/03/2023 21:56
23062071-004B	APW-07-WG-20230626	06/26/2023 15:20	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/17/2023 15:33
23062071-004C	APW-07-WG-20230626	06/26/2023 15:20	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:53
	SW-846 7470A (Total)			06/30/2023 14:49	07/05/2023 9:21
23062071-004D	APW-07-WG-20230626	06/26/2023 15:20	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 18:15
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 16:33
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 5:56
23062071-005A	APW-10S-WG-20230626	06/26/2023 17:00	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:05
	SW-846 9036 (Total)				07/03/2023 22:03
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:45
	SW-846 9214 (Total)				07/03/2023 12:23
	SW-846 9251 (Total)				07/03/2023 22:04
23062071-005B	APW-10S-WG-20230626	06/26/2023 17:00	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/18/2023 9:09
23062071-005C	APW-10S-WG-20230626	06/26/2023 17:00	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/06/2023 4:06

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:15
	SW-846 7470A (Total)			06/30/2023 14:49	07/05/2023 9:23
23062071-005D	APW-10S-WG-20230626	06/26/2023 17:00	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 17:56
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 16:15
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 5:38
23062071-006A	APW-10D-WG-20230626	06/26/2023 18:45	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:21
	SW-846 9036 (Total)				07/03/2023 22:11
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:49
	SW-846 9214 (Total)				07/03/2023 12:43
	SW-846 9251 (Total)				07/03/2023 22:12
23062071-006B	APW-10D-WG-20230626	06/26/2023 18:45	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/17/2023 15:33
23062071-006C	APW-10D-WG-20230626	06/26/2023 18:45	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:22
	SW-846 7470A (Total)			06/30/2023 14:49	07/05/2023 9:30
23062071-006D	APW-10D-WG-20230626	06/26/2023 18:45	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 18:02
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 16:21
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 5:44
23062071-007A	APW-06S-WG-20230627	06/27/2023 9:10	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:21
	SW-846 9036 (Total)				07/03/2023 22:25
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:51
	SW-846 9214 (Total)				07/03/2023 12:45
	SW-846 9251 (Total)				07/03/2023 22:20
23062071-007B	APW-06S-WG-20230627	06/27/2023 9:10	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/17/2023 15:33
23062071-007C	APW-06S-WG-20230627	06/27/2023 9:10	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:28
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 8:37
23062071-007D	APW-06S-WG-20230627	06/27/2023 9:10	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 18:08
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 16:27
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 5:50

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23062071-008A	APW-06D-WG-20230627	06/27/2023 10:35	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:21
	SW-846 9036 (Total)				07/03/2023 22:49
	SW-846 9040B, Laboratory Analyzed				06/29/2023 11:54
	SW-846 9214 (Total)				07/03/2023 12:47
	SW-846 9251 (Total)				07/03/2023 22:44
23062071-008B	APW-06D-WG-20230627	06/27/2023 10:35	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/18/2023 9:09
23062071-008C	APW-06D-WG-20230627	06/27/2023 10:35	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:34
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 8:39
23062071-008D	APW-06D-WG-20230627	06/27/2023 10:35	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 18:59
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 17:16
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 6:39
23062071-009A	APW-02-WG-20230627	06/27/2023 12:15	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:21
	SW-846 9036 (Total)				07/03/2023 22:57
	SW-846 9040B, Laboratory Analyzed				06/29/2023 12:00
	SW-846 9214 (Total)				07/03/2023 12:49
	SW-846 9251 (Total)				07/03/2023 22:52
23062071-009B	APW-02-WG-20230627	06/27/2023 12:15	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/18/2023 9:09
23062071-009C	APW-02-WG-20230627	06/27/2023 12:15	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:41
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 8:46
23062071-009D	APW-02-WG-20230627	06/27/2023 12:15	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 19:05
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 17:22
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 6:45
23062071-010A	APW-05R-WG-20230627	06/27/2023 14:10	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/28/2023 15:22
	SW-846 9036 (Total)				07/03/2023 23:06
	SW-846 9040B, Laboratory Analyzed				06/29/2023 12:03
	SW-846 9214 (Total)				07/03/2023 12:55
	SW-846 9251 (Total)				07/03/2023 23:00

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23062071-010B	APW-05R-WG-20230627	06/27/2023 14:10	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/20/2023 15:16
23062071-010C	APW-05R-WG-20230627	06/27/2023 14:10	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 4:47
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 8:48
23062071-010D	APW-05R-WG-20230627	06/27/2023 14:10	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 19:11
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 17:28
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 6:51
23062071-011A	APW-09-WG-20230627	06/27/2023 15:20	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/29/2023 11:35
	SW-846 9036 (Total)				07/03/2023 23:07
	SW-846 9040B, Laboratory Analyzed				06/29/2023 14:43
	SW-846 9214 (Total)				07/03/2023 12:57
	SW-846 9251 (Total)				07/03/2023 23:08
23062071-011B	APW-09-WG-20230627	06/27/2023 15:20	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/20/2023 15:16
23062071-011C	APW-09-WG-20230627	06/27/2023 15:20	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 5:57
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 8:51
23062071-011D	APW-09-WG-20230627	06/27/2023 15:20	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 19:43
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 17:59
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 7:21
23062071-012A	APW-01R-WG-20230627	06/27/2023 16:30	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/29/2023 11:35
	SW-846 9036 (Total)				07/06/2023 13:39
	SW-846 9040B, Laboratory Analyzed				06/29/2023 14:46
	SW-846 9214 (Total)				07/03/2023 12:51
	SW-846 9251 (Total)				07/03/2023 23:18
23062071-012B	APW-01R-WG-20230627	06/27/2023 16:30	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/20/2023 15:16
23062071-012C	APW-01R-WG-20230627	06/27/2023 16:30	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 6:03
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 8:53
23062071-012D	APW-01R-WG-20230627	06/27/2023 16:30	06/28/2023 10:10		

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	06/29/2023 19:18
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/03/2023 17:34
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:26	07/06/2023 6:57
23062071-013A	APW-04-WG-20230627	06/27/2023 17:35	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/29/2023 11:35
	SW-846 9036 (Total)				07/06/2023 14:12
	SW-846 9040B, Laboratory Analyzed				06/29/2023 14:50
	SW-846 9214 (Total)				07/03/2023 12:53
	SW-846 9251 (Total)				07/03/2023 23:56
23062071-013B	APW-04-WG-20230627	06/27/2023 17:35	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/20/2023 15:16
23062071-013C	APW-04-WG-20230627	06/27/2023 17:35	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 6:10
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 9:00
23062071-013D	APW-04-WG-20230627	06/27/2023 17:35	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	06/29/2023 19:24
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	07/03/2023 17:41
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	07/06/2023 7:03
23062071-014A	DUP-01-WG-20230627	06/27/2023 0:01	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/29/2023 11:36
	SW-846 9036 (Total)				07/04/2023 0:09
	SW-846 9040B, Laboratory Analyzed				06/29/2023 14:53
	SW-846 9214 (Total)				07/03/2023 13:07
	SW-846 9251 (Total)				07/04/2023 0:04
23062071-014B	DUP-01-WG-20230627	06/27/2023 0:01	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/20/2023 15:16
23062071-014C	DUP-01-WG-20230627	06/27/2023 0:01	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 10:51	07/07/2023 6:16
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 9:02
23062071-014D	DUP-01-WG-20230627	06/27/2023 0:01	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	06/29/2023 19:30
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	07/03/2023 17:47
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	07/06/2023 7:09
23062071-015A	DUP-02-WG-20230627	06/27/2023 0:02	06/28/2023 10:10		
	Standard Methods 2540 C (Total) 1997, 2011				06/29/2023 11:36
	SW-846 9036 (Total)				07/06/2023 14:20

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 9040B, Laboratory Analyzed				06/29/2023 14:56
	SW-846 9214 (Total)				07/03/2023 13:09
	SW-846 9251 (Total)				07/04/2023 0:12
23062071-015B	DUP-02-WG-20230627	06/27/2023 0:02	06/28/2023 10:10		
	EPA 903.0/904.0, Radium 226/228				07/20/2023 15:16
23062071-015C	DUP-02-WG-20230627	06/27/2023 0:02	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 12:56	07/05/2023 22:45
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			07/03/2023 12:56	07/06/2023 22:13
	SW-846 7470A (Total)			07/05/2023 10:52	07/06/2023 9:04
23062071-015D	DUP-02-WG-20230627	06/27/2023 0:02	06/28/2023 10:10		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	06/29/2023 19:36
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	07/03/2023 17:53
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			06/28/2023 19:48	07/06/2023 7:15

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

STANDARD METHODS 2540 C (TOTAL) 1997, 2011

Batch R330972 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	06/28/2023

Batch R330972 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**966**	1000	0	96.6	90	110	06/28/2023

Batch R330972 **SampType:** DUP Units **mg/L** RPD Limit **10**
SampID: 23062071-002ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		20		**626**				614.0	1.94	06/28/2023

Batch R331052 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	06/29/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	06/29/2023

Batch R331052 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**948**	1000	0	94.8	90	110	06/29/2023
Total Dissolved Solids		20		**938**	1000	0	93.8	90	110	06/29/2023

Batch R331052 **SampType:** DUP Units **mg/L** RPD Limit **10**
SampID: 23062071-015ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		50		**905**				870.0	3.94	06/29/2023

SW-846 9036 (TOTAL)

Batch R331147 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	07/03/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 9036 (TOTAL)

Batch R331147 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**18**	20.00	0	91.6	90	110	07/03/2023

Batch R331147 **SampType:** MS Units **mg/L**
SampID: 23062071-002AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		100		**484**	200.0	292.1	96.1	85	115	07/03/2023

Batch R331147 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 23062071-002AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		100		**468**	200.0	292.1	88.1	484.4	3.37	07/03/2023

Batch R331244 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	07/06/2023

Batch R331244 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	93.3	90	110	07/06/2023

Batch R331244 **SampType:** MS Units **mg/L**
SampID: 23062071-012AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		20		**75**	40.00	37.28	93.7	85	115	07/06/2023

Batch R331244 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 23062071-012AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		20		**76**	40.00	37.28	96.7	74.74	1.61	07/06/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 9040B, LABORATORY ANALYZED

Batch R330948 **SampType:** LCS Units

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		**6.97**	7.000	0	99.6	99.29	100.7	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-001ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**5.25**				5.330	1.51	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-002ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.79**				7.770	0.26	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-003ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.19**				7.180	0.14	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-004ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.81**				6.790	0.29	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-005ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.01**				7.010	0.00	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-006ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.98**				6.980	0.00	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-007ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.07**				7.050	0.28	06/29/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 9040B, LABORATORY ANALYZED

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-008ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.40**				7.390	0.14	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-009ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.95**				6.900	0.72	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-010ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.28**				7.270	0.14	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-011ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.34**				7.320	0.27	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-012ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.55**				6.530	0.31	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-013ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.39**				7.390	0.00	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-014ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.31**				7.300	0.14	06/29/2023

Batch R330948 **SampType:** DUP Units RPD Limit **10**

SampID: 23062071-015ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.03**				7.030	0.00	06/29/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 9214 (TOTAL)

Batch R331110 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**< 0.10**	0.0500	0	0	-100	100	07/03/2023

Batch R331110 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**0.92**	1.000	0	92.0	90	110	07/03/2023

Batch R331110 **SampType:** MS Units **mg/L**
SampID: 23062071-005AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.06**	2.000	0.1500	95.6	75	125	07/03/2023

Batch R331110 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-005AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.06**	2.000	0.1500	95.8	2.061	0.19	07/03/2023

Batch R331110 **SampType:** MS Units **mg/L**
SampID: 23062071-011AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.15**	2.000	0.1860	98.1	75	125	07/03/2023

Batch R331110 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-011AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.14**	2.000	0.1860	97.8	2.148	0.33	07/03/2023

Batch R331110 **SampType:** MS Units **mg/L**
SampID: 23062071-015AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.14**	2.000	0.2250	95.7	75	125	07/03/2023

Batch R331110 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-015AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.15**	2.000	0.2250	96.3	2.139	0.51	07/03/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 9251 (TOTAL)

Batch R331159 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	07/03/2023

Batch R331159 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**20**	20.00	0	99.6	90	110	07/03/2023

Batch R331159 **SampType:** MS Units **mg/L**
SampID: 23062071-002AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**36**	20.00	17.09	93.9	85	115	07/03/2023

Batch R331159 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-002AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		4		**36**	20.00	17.09	93.0	35.87	0.53	07/03/2023

Batch R331159 **SampType:** MS Units **mg/L**
SampID: 23062071-012AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**21**	20.00	1.650	94.6	85	115	07/03/2023

Batch R331159 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-012AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		4		**21**	20.00	1.650	95.6	20.57	0.92	07/03/2023

Batch R331275 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	07/06/2023

Batch R331275 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**20**	20.00	0	102.5	90	110	07/06/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 207896 **SampType:** MBLK Units **mg/L**

SampID: MBLK-207896

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	06/29/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	06/29/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	06/29/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	06/29/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	07/03/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	06/29/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	07/03/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	06/29/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	06/29/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	06/29/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	06/29/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	06/29/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	06/29/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	06/29/2023

Batch 207896 **SampType:** LCS Units **mg/L**

SampID: LCS-207896

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.527**	0.5000	0	105.3	80	120	07/03/2023
Arsenic		0.0010		**0.433**	0.5000	0	86.7	80	120	06/29/2023
Barium		0.0010		**2.18**	2.000	0	108.8	80	120	07/03/2023
Beryllium		0.0010		**0.0481**	0.0500	0	96.2	80	120	07/03/2023
Boron		0.0250		**0.494**	0.5000	0	98.7	80	120	07/03/2023
Cadmium		0.0010		**0.0504**	0.0500	0	100.7	80	120	07/03/2023
Calcium		0.125		**2.49**	2.500	0	99.8	80	120	07/03/2023
Chromium		0.0015		**0.215**	0.2000	0	107.4	80	120	07/06/2023
Cobalt		0.0010		**0.541**	0.5000	0	108.2	80	120	07/06/2023
Lead		0.0010		**0.530**	0.5000	0	106.1	80	120	07/03/2023
Lithium	*	0.0030		**0.457**	0.5000	0	91.4	80	120	06/29/2023
Molybdenum		0.0015		**0.496**	0.5000	0	99.2	80	120	07/03/2023
Selenium		0.0010		**0.405**	0.5000	0	81.0	80	120	06/29/2023
Thallium		0.0020		**0.252**	0.2500	0	100.6	80	120	07/03/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 207896 **SampType:** MS Units **mg/L**

SampID: 23062071-004DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.431**	0.5000	0	86.3	75	125	07/03/2023
Arsenic		0.0010		**0.444**	0.5000	0.001228	88.5	75	125	06/29/2023
Barium		0.0010		**2.02**	2.000	0.3029	85.8	75	125	07/03/2023
Beryllium		0.0010		**0.0410**	0.0500	0	81.9	75	125	07/03/2023
Boron		0.0250		**0.627**	0.5000	0.2084	83.7	75	125	07/03/2023
Cadmium		0.0010		**0.0428**	0.0500	0	85.5	75	125	07/03/2023
Calcium		0.125	S	**173**	2.500	179.6	-281.4	75	125	07/03/2023
Chromium		0.0015		**0.185**	0.2000	0	92.6	75	125	07/06/2023
Cobalt		0.0010		**0.456**	0.5000	0	91.1	75	125	07/06/2023
Lead		0.0010		**0.431**	0.5000	0	86.3	75	125	07/03/2023
Lithium	*	0.0030		**0.461**	0.5000	0.01363	89.4	75	125	06/29/2023
Molybdenum		0.0015		**0.425**	0.5000	0.002674	84.4	75	125	07/03/2023
Selenium		0.0010		**0.406**	0.5000	0	81.3	75	125	06/29/2023
Thallium		0.0020		**0.206**	0.2500	0	82.5	75	125	07/03/2023

Batch 207896 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23062071-004DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.433**	0.5000	0	86.7	0.4313	0.49	07/03/2023
Arsenic		0.0010		**0.468**	0.5000	0.001228	93.4	0.4437	5.33	06/29/2023
Barium		0.0010		**2.02**	2.000	0.3029	85.7	2.019	0.11	07/03/2023
Beryllium		0.0010		**0.0411**	0.0500	0	82.2	0.04096	0.36	07/03/2023
Boron		0.0250		**0.622**	0.5000	0.2084	82.8	0.6271	0.75	07/03/2023
Cadmium		0.0010		**0.0422**	0.0500	0	84.4	0.04277	1.37	07/03/2023
Calcium		0.125	S	**174**	2.500	179.6	-221.6	172.6	0.86	07/03/2023
Chromium		0.0015		**0.183**	0.2000	0	91.4	0.1853	1.30	07/06/2023
Cobalt		0.0010		**0.451**	0.5000	0	90.2	0.4557	1.05	07/06/2023
Lead		0.0010		**0.434**	0.5000	0	86.7	0.4315	0.47	07/03/2023
Lithium	*	0.0030		**0.477**	0.5000	0.01363	92.6	0.4607	3.40	06/29/2023
Molybdenum		0.0015		**0.429**	0.5000	0.002674	85.2	0.4246	0.98	07/03/2023
Selenium		0.0010		**0.428**	0.5000	0	85.7	0.4063	5.30	06/29/2023
Thallium		0.0020		**0.204**	0.2500	0	81.5	0.2063	1.21	07/03/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 207896 **SampType:** MS Units **mg/L**

SampID: 23062071-011DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.429**	0.5000	0	85.9	75	125	07/03/2023
Arsenic		0.0010		**0.444**	0.5000	0.002084	88.4	75	125	06/29/2023
Barium		0.0010		**1.78**	2.000	0.1160	83.3	75	125	07/03/2023
Beryllium		0.0010		**0.0421**	0.0500	0	84.1	75	125	07/03/2023
Boron		0.0250		**1.02**	0.5000	0.5720	88.8	75	125	07/06/2023
Cadmium		0.0010		**0.0425**	0.0500	0	85.1	75	125	07/03/2023
Calcium		0.125	S	**80.8**	2.500	82.79	-80.5	75	125	07/03/2023
Chromium		0.0015		**0.173**	0.2000	0	86.4	75	125	07/06/2023
Cobalt		0.0010		**0.425**	0.5000	0	85.1	75	125	07/06/2023
Lead		0.0010		**0.439**	0.5000	0	87.8	75	125	07/03/2023
Lithium	*	0.0030		**0.484**	0.5000	0.01627	93.5	75	125	06/29/2023
Molybdenum		0.0015		**0.436**	0.5000	0.02111	83.0	75	125	07/03/2023
Selenium		0.0010		**0.429**	0.5000	0.01862	82.1	75	125	06/29/2023
Thallium		0.0020		**0.204**	0.2500	0	81.7	75	125	07/03/2023

Batch 207896 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23062071-011DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.391**	0.5000	0	78.3	0.4294	9.28	07/03/2023
Arsenic		0.0010		**0.415**	0.5000	0.002084	82.6	0.4439	6.65	06/29/2023
Barium		0.0010		**1.67**	2.000	0.1160	77.5	1.781	6.68	07/03/2023
Beryllium		0.0010		**0.0393**	0.0500	0	78.5	0.04206	6.90	07/03/2023
Boron		0.0250		**0.960**	0.5000	0.5720	77.7	1.016	5.64	07/06/2023
Cadmium		0.0010		**0.0379**	0.0500	0	75.8	0.04254	11.54	07/03/2023
Calcium		0.125	S	**81.2**	2.500	82.79	-65.4	80.78	0.47	07/03/2023
Chromium		0.0015		**0.162**	0.2000	0	80.8	0.1729	6.78	07/06/2023
Cobalt		0.0010		**0.398**	0.5000	0	79.5	0.4253	6.75	07/06/2023
Lead		0.0010		**0.412**	0.5000	0	82.4	0.4392	6.36	07/03/2023
Lithium	*	0.0030		**0.480**	0.5000	0.01627	92.7	0.4836	0.75	06/29/2023
Molybdenum		0.0015		**0.404**	0.5000	0.02111	76.6	0.4360	7.57	07/03/2023
Selenium		0.0010		**0.402**	0.5000	0.01862	76.7	0.4290	6.50	06/29/2023
Thallium		0.0020		**0.192**	0.2500	0	77.0	0.2043	5.96	07/03/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 207943 **SampType:** MBLK Units **mg/L**

SampID: MBLK-207943

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	07/03/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	07/03/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	07/03/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	07/03/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	07/03/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	07/03/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	07/03/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	07/06/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	07/06/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	07/03/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	07/06/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	07/03/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	07/03/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	07/03/2023

Batch 207943 **SampType:** LCS Units **mg/L**

SampID: LCS-207943

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.482**	0.5000	0	96.3	80	120	07/03/2023
Arsenic		0.0010		**0.513**	0.5000	0	102.5	80	120	07/03/2023
Barium		0.0010		**2.05**	2.000	0	102.6	80	120	07/03/2023
Beryllium		0.0010		**0.0464**	0.0500	0	92.8	80	120	07/03/2023
Boron		0.0250		**0.504**	0.5000	0	100.8	80	120	07/03/2023
Cadmium		0.0010		**0.0482**	0.0500	0	96.3	80	120	07/03/2023
Calcium		0.125		**2.40**	2.500	0	96.2	80	120	07/03/2023
Chromium		0.0015		**0.211**	0.2000	0	105.3	80	120	07/06/2023
Cobalt		0.0010		**0.539**	0.5000	0	107.9	80	120	07/06/2023
Lead		0.0010		**0.527**	0.5000	0	105.4	80	120	07/03/2023
Lithium	*	0.0030		**0.502**	0.5000	0	100.5	80	120	07/06/2023
Molybdenum		0.0015		**0.486**	0.5000	0	97.2	80	120	07/03/2023
Selenium		0.0010		**0.475**	0.5000	0	95.0	80	120	07/03/2023
Thallium		0.0020		**0.246**	0.2500	0	98.3	80	120	07/03/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 207943 **SampType:** MS Units **mg/L**

SampID: 23062071-001DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.469**	0.5000	0	93.8	75	125	07/04/2023
Arsenic		0.0010		**0.468**	0.5000	0	93.7	75	125	07/04/2023
Barium		0.0010		**1.96**	2.000	0	98.1	75	125	07/04/2023
Beryllium		0.0010		**0.0452**	0.0500	0	90.5	75	125	07/04/2023
Boron		0.0250		**0.492**	0.5000	0	98.4	75	125	07/04/2023
Cadmium		0.0010		**0.0455**	0.0500	0	91.0	75	125	07/04/2023
Calcium		0.125		**2.18**	2.500	0	87.0	75	125	07/04/2023
Chromium		0.0015		**0.199**	0.2000	0	99.3	75	125	07/06/2023
Cobalt		0.0010		**0.500**	0.5000	0	100.1	75	125	07/06/2023
Lead		0.0010		**0.514**	0.5000	0	102.9	75	125	07/04/2023
Lithium	*	0.0030		**0.485**	0.5000	0	97.1	75	125	07/06/2023
Molybdenum		0.0015		**0.457**	0.5000	0	91.3	75	125	07/04/2023
Selenium		0.0010		**0.437**	0.5000	0	87.5	75	125	07/04/2023
Thallium		0.0020		**0.244**	0.2500	0	97.5	75	125	07/04/2023

Batch 207943 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23062071-001DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.478**	0.5000	0	95.5	0.4691	1.81	07/04/2023
Arsenic		0.0010		**0.498**	0.5000	0	99.5	0.4683	6.06	07/04/2023
Barium		0.0010		**2.00**	2.000	0	100.2	1.962	2.14	07/04/2023
Beryllium		0.0010		**0.0452**	0.0500	0	90.3	0.04523	0.13	07/04/2023
Boron		0.0250		**0.502**	0.5000	0	100.4	0.4920	2.06	07/04/2023
Cadmium		0.0010		**0.0474**	0.0500	0	94.8	0.04551	4.08	07/04/2023
Calcium		0.125		**2.14**	2.500	0	85.7	2.176	1.58	07/04/2023
Chromium		0.0015		**0.209**	0.2000	0	104.4	0.1986	5.04	07/06/2023
Cobalt		0.0010		**0.535**	0.5000	0	106.9	0.5004	6.60	07/06/2023
Lead		0.0010		**0.522**	0.5000	0	104.5	0.5145	1.51	07/04/2023
Lithium	*	0.0030		**0.498**	0.5000	0	99.5	0.4854	2.46	07/06/2023
Molybdenum		0.0015		**0.477**	0.5000	0	95.4	0.4567	4.37	07/04/2023
Selenium		0.0010		**0.460**	0.5000	0	91.9	0.4374	4.97	07/04/2023
Thallium		0.0020		**0.245**	0.2500	0	97.9	0.2436	0.42	07/04/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 208035 **SampType:** MBLK Units **mg/L**

SampID: MBLK-208035

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	07/06/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	07/07/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	07/06/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	07/07/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	07/07/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	07/07/2023
Calcium		0.125	S	**0.260**	0.0700	0	371.9	-100	100	07/07/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	07/07/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	07/07/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	07/06/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	07/07/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	07/07/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	07/07/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	07/06/2023

Batch 208035 **SampType:** LCS Units **mg/L**

SampID: LCS-208035

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.551**	0.5000	0	110.2	85	115	07/06/2023
Arsenic		0.0010		**0.517**	0.5000	0	103.5	80	120	07/07/2023
Barium		0.0010		**2.10**	2.000	0	104.8	80	120	07/07/2023
Beryllium		0.0010		**0.0479**	0.0500	0	95.8	80	120	07/07/2023
Boron		0.0250		**0.497**	0.5000	0	99.4	80	120	07/07/2023
Cadmium		0.0010		**0.0482**	0.0500	0	96.4	80	120	07/07/2023
Calcium		0.125	B	**2.70**	2.500	0	108.0	80	120	07/07/2023
Chromium		0.0015		**0.199**	0.2000	0	99.3	80	120	07/07/2023
Cobalt		0.0010		**0.497**	0.5000	0	99.4	80	120	07/07/2023
Lead		0.0010		**0.518**	0.5000	0	103.6	85	115	07/06/2023
Lithium	*	0.0030		**0.483**	0.5000	0	96.5	80	120	07/07/2023
Molybdenum		0.0015		**0.471**	0.5000	0	94.1	80	120	07/07/2023
Selenium		0.0010		**0.481**	0.5000	0	96.1	80	120	07/07/2023
Thallium		0.0020		**0.246**	0.2500	0	98.4	85	115	07/06/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 208035 **SampType:** MS Units **mg/L**

SampID: 23062071-004CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.536**	0.5000	0	107.3	75	125	07/07/2023
Arsenic		0.0010		**0.539**	0.5000	0.001382	107.5	75	125	07/07/2023
Barium		0.0010		**2.53**	2.000	0.3121	111.0	75	125	07/07/2023
Beryllium		0.0010		**0.0499**	0.0500	0	99.7	75	125	07/07/2023
Boron		0.0250		**0.724**	0.5000	0.2368	97.4	75	125	07/07/2023
Cadmium		0.0010		**0.0516**	0.0500	0	103.1	75	125	07/07/2023
Calcium		0.125	BS	**189**	2.500	183.1	237.9	75	125	07/07/2023
Chromium		0.0015		**0.206**	0.2000	0	103.2	75	125	07/07/2023
Cobalt		0.0010		**0.506**	0.5000	0.0004089	101.1	75	125	07/07/2023
Lead		0.0010		**0.528**	0.5000	0	105.6	75	125	07/07/2023
Lithium	*	0.0030		**0.524**	0.5000	0.01531	101.7	75	125	07/07/2023
Molybdenum		0.0015		**0.518**	0.5000	0.002814	103.0	75	125	07/07/2023
Selenium		0.0010		**0.505**	0.5000	0	101.0	75	125	07/07/2023
Thallium		0.0020		**0.250**	0.2500	0	100.1	75	125	07/07/2023

Batch 208035 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23062071-004CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.501**	0.5000	0	100.2	0.5365	6.85	07/07/2023
Arsenic		0.0010		**0.510**	0.5000	0.001382	101.7	0.5390	5.56	07/07/2023
Barium		0.0010		**2.39**	2.000	0.3121	104.1	2.531	5.61	07/07/2023
Beryllium		0.0010		**0.0489**	0.0500	0	97.8	0.04986	1.93	07/07/2023
Boron		0.0250		**0.695**	0.5000	0.2368	91.6	0.7237	4.10	07/07/2023
Cadmium		0.0010		**0.0482**	0.0500	0	96.4	0.05157	6.73	07/07/2023
Calcium		0.125	BS	**182**	2.500	183.1	-44.2	189.1	3.80	07/07/2023
Chromium		0.0015		**0.198**	0.2000	0	99.2	0.2065	3.97	07/07/2023
Cobalt		0.0010		**0.486**	0.5000	0.0004089	97.1	0.5058	3.99	07/07/2023
Lead		0.0010		**0.519**	0.5000	0	103.8	0.5280	1.69	07/07/2023
Lithium	*	0.0030		**0.507**	0.5000	0.01531	98.3	0.5237	3.26	07/07/2023
Molybdenum		0.0015		**0.482**	0.5000	0.002814	95.9	0.5178	7.14	07/07/2023
Selenium		0.0010		**0.471**	0.5000	0	94.1	0.5048	6.99	07/07/2023
Thallium		0.0020		**0.250**	0.2500	0	100.0	0.2503	0.11	07/07/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 208048 **SampType:** MBLK Units **mg/L**

SampID: MBLK-208048

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	07/05/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	07/05/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	07/05/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	07/06/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	07/06/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	07/05/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	07/06/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	07/05/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	07/05/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	07/05/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	07/06/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	07/06/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	07/05/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	07/05/2023

Batch 208048 **SampType:** LCS Units **mg/L**

SampID: LCS-208048

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.537**	0.5000	0	107.3	80	120	07/06/2023
Arsenic		0.0010		**0.542**	0.5000	0	108.4	80	120	07/05/2023
Barium		0.0010		**2.21**	2.000	0	110.7	80	120	07/06/2023
Beryllium		0.0010		**0.0520**	0.0500	0	104.0	80	120	07/06/2023
Boron		0.0250		**0.535**	0.5000	0	107.0	80	120	07/06/2023
Cadmium		0.0010		**0.0482**	0.0500	0	96.5	80	120	07/05/2023
Calcium		0.125		**2.82**	2.500	0	112.8	80	120	07/06/2023
Chromium		0.0015		**0.210**	0.2000	0	104.8	80	120	07/05/2023
Cobalt		0.0010		**0.513**	0.5000	0	102.6	80	120	07/05/2023
Lead		0.0010		**0.502**	0.5000	0	100.4	80	120	07/05/2023
Lithium	*	0.0030		**0.521**	0.5000	0	104.1	80	120	07/06/2023
Molybdenum		0.0015		**0.515**	0.5000	0	103.0	80	120	07/06/2023
Selenium		0.0010		**0.486**	0.5000	0	97.2	80	120	07/05/2023
Thallium		0.0020		**0.251**	0.2500	0	100.5	80	120	07/05/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 208048 **SampType:** MS Units **mg/L**

SampID: 23062071-015CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Arsenic		0.0010		**0.547**	0.5000	0.01457	106.6	75	125	07/05/2023
Arsenic		0.0010		**0.560**	0.5000	0.01576	108.9	75	125	07/06/2023
Barium		0.0010		**2.29**	2.000	0.2057	104.2	75	125	07/06/2023
Beryllium		0.0010		**0.0508**	0.0500	0.0002715	101.0	75	125	07/06/2023
Boron		0.0250	S	**9.60**	0.5000	9.506	19.0	75	125	07/06/2023
Cadmium		0.0010		**0.0469**	0.0500	0.0002636	93.3	75	125	07/05/2023
Calcium		0.125	S	**160**	2.500	167.0	-272.8	75	125	07/06/2023
Chromium		0.0015		**0.201**	0.2000	0.007883	96.6	75	125	07/05/2023
Cobalt		0.0010		**0.483**	0.5000	0.001560	96.3	75	125	07/05/2023
Lead		0.0010		**0.513**	0.5000	0.002909	102.0	75	125	07/05/2023
Lithium	*	0.0030		**0.575**	0.5000	0.04800	105.5	75	125	07/06/2023
Molybdenum		0.0015		**0.754**	0.5000	0.2517	100.4	75	125	07/06/2023
Selenium		0.0010		**0.469**	0.5000	0	93.9	75	125	07/05/2023
Thallium		0.0020		**0.255**	0.2500	0	102.0	75	125	07/05/2023

Batch 208048 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23062071-015CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Arsenic		0.0010		**0.569**	0.5000	0.01576	110.7	0.5602	1.57	07/06/2023
Arsenic		0.0010		**0.575**	0.5000	0.01457	112.1	0.5475	4.91	07/05/2023
Barium		0.0010		**2.29**	2.000	0.2057	104.1	2.289	0.04	07/06/2023
Beryllium		0.0010		**0.0517**	0.0500	0.0002715	102.9	0.05079	1.85	07/06/2023
Boron		0.0250	S	**9.78**	0.5000	9.506	55.1	9.601	1.86	07/06/2023
Cadmium		0.0010		**0.0502**	0.0500	0.0002636	99.9	0.04692	6.77	07/05/2023
Calcium		0.125	S	**164**	2.500	167.0	-125.7	160.2	2.27	07/06/2023
Chromium		0.0015		**0.215**	0.2000	0.007883	103.7	0.2012	6.77	07/05/2023
Cobalt		0.0010		**0.510**	0.5000	0.001560	101.7	0.4833	5.36	07/05/2023
Lead		0.0010		**0.527**	0.5000	0.002909	104.8	0.5128	2.66	07/05/2023
Lithium	*	0.0030		**0.588**	0.5000	0.04800	108.0	0.5754	2.16	07/06/2023
Molybdenum		0.0015		**0.760**	0.5000	0.2517	101.7	0.7535	0.86	07/06/2023
Selenium		0.0010		**0.495**	0.5000	0	99.0	0.4693	5.32	07/05/2023
Thallium		0.0020		**0.270**	0.2500	0	108.0	0.2550	5.77	07/05/2023

Client: ERM **Work Order:** 23062071

Client Project: 0599247 **Report Date:** 10-Aug-23

SW-846 7470A (TOTAL)

Batch 207990 **SampType:** MBLK Units **mg/L**
SampID: MBLK-207990

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	07/05/2023

Batch 207990 **SampType:** LCS Units **mg/L**
SampID: LCS-207990

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00448**	0.0050	0	89.6	85	115	07/03/2023

Batch 207990 **SampType:** MS Units **mg/L**
SampID: 23062071-001CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00527**	0.0050	0	105.4	75	125	07/05/2023

Batch 207990 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-001CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00517**	0.0050	0	103.4	0.005268	1.84	07/05/2023

Batch 208092 **SampType:** MBLK Units **mg/L**
SampID: MBLK-208092

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	07/06/2023

Batch 208092 **SampType:** LCS Units **mg/L**
SampID: LCS-208092

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00488**	0.0050	0	97.7	85	115	07/06/2023

Batch 208092 **SampType:** MS Units **mg/L**
SampID: 23062071-008CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00491**	0.0050	0	98.2	75	125	07/06/2023

Batch 208092 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23062071-008CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00487**	0.0050	0	97.4	0.004912	0.90	07/06/2023

Receiving Check List

http://www.teklabinc.com/

Client: ERM
Client Project: 0599247

Work Order: 23062071
Report Date: 10-Aug-23

Carrier: Clay Sansoucie

Received By: MBP

Completed by: Allison Colin
On: 28-Jun-23

Reviewed by: Ellie Hopkins
On: 28-Jun-23

Pages to follow: Chain of custody 2 Extra pages included 39

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 4.0
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☐	No ☑		
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐	

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Any No responses must be detailed below or on the COC.

pH strip #88374. - acolin - 6/28/2023 11:13:59 AM

Additional HNO3 (90404) was needed in APW-08 and APW-10S upon arrival at the laboratory. - acolin - 6/28/2023 11:14:09 AM

EB-01-WQ-20230626 was split, filtered and preserved witih HNO3 (90404) upon arrival at laboratory. - TWM - 6/28/23

CHAIN OF CUSTODY

pg. 1 of 2 Work order # 23062071

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client: ERM
Address: 1968 Craig Road
City / State / Zip St. Louis, MO 63146
Contact: Matt Halley **Phone:** (314) 952-2760
E-Mail: matt.halley@erm.com **Fax:**

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 4.0 °C LTG# 3
Preserved in: [X] LAB [ ] FIELD **FOR LAB USE ONLY**
Lab Notes 88374 Added HNO3(90404) to: APW08, APW10S
ERM Springfield project = Grand Tower CCR GW

Are these samples known to be involved in litigation? If yes, a surcharge will apply [ ] Yes [X] No
Are these samples known to be hazardous? [ ] Yes [X] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. [X] Yes [ ] No

Client Comments:
Total Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se Tl and Hg
Dissolved Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se and Tl
FILTERED ~~FOR~~ EQUIPMENT BLANK FOR DISSOLVED METALS UPON ARRIVAL AT LAB.

Project Name/Number: 0599247
Sample Collector's Name: C. Sansoucie / M. Arendell

Results Requested: [X] Standard [ ] 1-2 Day (100% Surcharge) [ ] Other [ ] 3 Day (50% Surcharge)
Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	Chloride	Dissolved Metals	Fluoride	pH TDS	Radium 226/228	Sulfate	Total Metals
062071-001	EB-01-WQ-20230626	6/26/23; 0900	1	2		1										X	X	X	X	X	X	X	X
002	APW-03-WG-20230626	6/26/23; 1210	1	2		2										↓	↓	↓	X	↓	↓	↓	↓
003	APW-08-WG-20230626	6/26/23; 1415	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
004	APW-07-WG-20230626	6/26/23; 1520	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
005	APW-10S-WG-20230626	6/26/23; 1700	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
006	APW-10D-WG-20230626	6/26/23; 1845	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
007	APW-06S-WG-20230627	6/27/23; 0910	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
008	APW-06D-WG-20230627	6/27/23; 1035	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
009	APW-02-WG-20230627	6/27/23; 1215	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓
010	APW-05R-WG-20230627	6/27/23; 1410	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓

Relinquished By	Date/Time	Received By	Date/Time
[signature]	6/28/23; 1010	[signature]	6/28/23 1010

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 81078

CHAIN OF CUSTODY

pg. 2 of 2 Work order # 23062071

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client:	ERM
Address:	1968 Craig Road
City / State / Zip	St. Louis, MO 63146
Contact:	Matt Halley
Phone:	(314) 952-2760
E-Mail:	matt.halley@erm.com
Fax:	

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 4.0 °C LTG# 3

Preserved in: [ ] LAB [ ] FIELD

FOR LAB USE ONLY

Lab Notes

ERM Springfield project = Grand Tower CCR GW

Client Comments:

Total Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se Tl and Hg

Dissolved Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se and Tl

Are these samples known to be involved in litigation? If yes, a surcharge will apply [ ] Yes [X] No

Are these samples known to be hazardous? [ ] Yes [X] No

Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. [X] Yes [ ] No

Project Name/Number: 0599247

Sample Collector's Name: C. Sansoucie / M. Arundell

Results Requested: [X] Standard [ ] 1-2 Day (100% Surcharge) [ ] Other ____ [ ] 3 Day (50% Surcharge)

Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	# and Type of Containers: UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	MATRIX: Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	INDICATE ANALYSIS REQUESTED: Chloride	Dissolved Metals	Fluoride	pH TDS	Radium 226/228	Sulfate	Total Metals
23062071-011	APW-09-WG-20230627	6/27/23; 1520	1	2		2										X	X	X	X	X	X	X	X
012	APW-01R-WG-20230627	6/27/23; 1630	1	2		2																	
013	APW-04-WG-20230627	6/27/23; 1735	1	2		2																	
014	DUP-01-WG-20230627	6/27/23; 0001	1	2		2																	
015	DUP-02-WG-20230627	6/27/23; 0002	1	2		2																	

Relinquished By	Date/Time	Received By	Date/Time
Cory Sansoucie	6/28/23; 1010	Nguyen Peeler	6/28/23 1010

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 81078

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

August 09, 2023

Elizabeth Hurley
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 23062071

Dear Elizabeth Hurley:

Order No.: 23070477

Summit Environmental Technologies, Inc. received 15 sample(s) on 7/7/2023 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

If you have any questions regarding these tests results, please feel free to call the laboratory.

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

Summit Environmental Technologies, Inc.
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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **23070477**
Date: **8/9/2023**

CLIENT: TEKLAB Inc,
Project: 23062071

WorkOrder Narrative:
23070477: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

 The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

Analytical Sequence Sample Notes:
23070477-010A Radium-228_NPW(904.0): Parent sample and duplicate exhibited a high RPD, both sample and duplicate are below PQL

REVISED REPORT 8/9/23: Corrected negative values for -005 & -009.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, In
3310 Win S
Cuyahoga Falls, Ohio 4422
TEL: (330) 253-8211 FAX: (330) 253-44
Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **23070477**
Date: **8/9/2023**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Workorder Sample Summary

WO#: **23070477**
09-Aug-23

CLIENT: TEKLAB Inc,
Project: 23062071

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
23070477-001	23062071-001		6/26/2023 9:00:00 AM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-002	23062071-002		6/26/2023 12:10:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-003	23062071-003		6/26/2023 2:15:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-004	23062071-004		6/26/2023 3:20:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-005	23062071-005		6/26/2023 5:00:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-006	23062071-006		6/26/2023 6:45:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-007	23062071-007		6/27/2023 9:10:00 AM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-008	23062071-008		6/27/2023 10:35:00 AM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-009	23062071-009		6/27/2023 12:15:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-010	23062071-010		6/27/2023 2:10:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-011	23062071-011		6/27/2023 3:20:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-012	23062071-012		6/27/2023 4:30:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-013	23062071-013		6/27/2023 5:35:00 PM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-014	23062071-014		6/27/2023 12:01:00 AM	7/7/2023 1:30:00 PM	Non-Potable Water
23070477-015	23062071-015		6/27/2023 12:02:00 AM	7/7/2023 1:30:00 PM	Non-Potable Water

Summit Environmental Technologies, Inc.
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Website: http://www.settek.com

DATES REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23070477-001A	23062071-001	6/26/2023 9:00:00 AM	Non-Potable Water	Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
23070477-002A	23062071-002	6/26/2023 12:10:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/25/2023 12:57:10 PM	8/2/2023 3:10:00 PM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
23070477-003A	23062071-003	6/26/2023 2:15:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
23070477-004A	23062071-004	6/26/2023 3:20:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
23070477-005A	23062071-005	6/26/2023 5:00:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/25/2023 12:57:10 PM	8/2/2023 3:10:00 PM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
23070477-006A	23062071-006	6/26/2023 6:45:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
23070477-007A	23062071-007	6/27/2023 9:10:00 AM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM

Revision v1

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

DATES REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,

Project: 23062071

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23070477-008A	23062071-008	6/27/2023 10:35:00 AM	Non-Potable Water	Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
				Radium-228 (EPA 904.0)		7/25/2023 12:57:10 PM	8/2/2023 3:10:00 PM
23070477-009A	23062071-009	6/27/2023 12:15:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/12/2023 11:59:36 AM	7/18/2023 9:09:00 AM
				Radium-228 (EPA 904.0)		7/12/2023 11:59:36 AM	7/17/2023 3:33:00 PM
				Radium-228 (EPA 904.0)		7/25/2023 12:57:10 PM	8/2/2023 3:10:00 PM
23070477-010A	23062071-010	6/27/2023 2:10:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/13/2023 12:34:34 PM	7/21/2023 9:43:00 AM
				Radium-228 (EPA 904.0)		7/13/2023 12:34:34 PM	7/20/2023 3:16:00 PM
23070477-011A	23062071-011	6/27/2023 3:20:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/13/2023 12:34:34 PM	7/21/2023 9:43:00 AM
				Radium-228 (EPA 904.0)		7/13/2023 12:34:34 PM	7/20/2023 3:16:00 PM
23070477-012A	23062071-012	6/27/2023 4:30:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/13/2023 12:34:34 PM	7/21/2023 9:43:00 AM
				Radium-228 (EPA 904.0)		7/13/2023 12:34:34 PM	7/20/2023 3:16:00 PM
23070477-013A	23062071-013	6/27/2023 5:35:00 PM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/13/2023 12:34:34 PM	7/21/2023 9:43:00 AM
				Radium-228 (EPA 904.0)		7/13/2023 12:34:34 PM	7/20/2023 3:16:00 PM
23070477-014A	23062071-014	6/27/2023 12:01:00 AM		Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/13/2023 12:34:34 PM	7/21/2023 9:43:00 AM
				Radium-228 (EPA 904.0)		7/13/2023 12:34:34 PM	7/20/2023 3:16:00 PM

Revision v1

Summit Environmental Technologies, Inc.
3310 Win St.
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DATES REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,

Project: 23062071

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23070477-015A	23062071-015	6/27/2023 12:02:00 AM	Non-Potable Water	Combined Radium (EPA903+904)			8/7/2023 8:05:48 AM
				Radium-226 (EPA 903.0)		7/13/2023 12:34:34 PM	7/21/2023 9:43:00 AM
				Radium-228 (EPA 904.0)		7/13/2023 12:34:34 PM	7/20/2023 3:16:00 PM

Revision v1

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/26/2023 9:00:00 AM

Project: 23062071

Lab ID: 23070477-001

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-001

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	2	2.00		pCi/L	± 0.87	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.01	1.00	U	pCi/L	± 0.06	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	1.99	1.00		pCi/L	± 0.81	1	7/17/2023 3:33:00 PM
Yield	1					1	7/17/2023 3:33:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,
Collection Date: 6/26/2023 12:10:00 PM

Project: 23062071

Lab ID: 23070477-002
Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-002

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.84	2.00	U	pCi/L	± 0.65	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.23	1.00	U	pCi/L	± 0.11	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.61	1.00	U	pCi/L	± 0.54	1	8/2/2023 3:10:00 PM
Yield	1					1	8/2/2023 3:10:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/26/2023 2:15:00 PM

Project: 23062071

Lab ID: 23070477-003

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-003

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.45	2.00	U	pCi/L	± 0.72	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.34	1.00	U	pCi/L	± 0.12	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.11	1.00	U	pCi/L	± 0.6	1	7/17/2023 3:33:00 PM
Yield	1					1	7/17/2023 3:33:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

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WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/26/2023 3:20:00 PM

Project: 23062071

Lab ID: 23070477-004

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-004

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.11	2.00	U	pCi/L	± 0.8	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	-0.01	1.00	U	pCi/L	± 0.06	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	1.11	1.00		pCi/L	± 0.74	1	7/17/2023 3:33:00 PM
Yield	1					1	7/17/2023 3:33:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

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WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/26/2023 5:00:00 PM

Project: 23062071

Lab ID: 23070477-005

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-005

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.37	2.00	U	pCi/L	± 0.6	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.37	1.00	U	pCi/L	± 0.13	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	-0.18	1.00	U	pCi/L	± 0.47	1	8/2/2023 3:10:00 PM
Yield	1					1	8/2/2023 3:10:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

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WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/26/2023 6:45:00 PM

Project: 23062071

Lab ID: 23070477-006

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-006

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.7	2.00	U	pCi/L	± 0.88	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.31	1.00	U	pCi/L	± 0.12	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	1.39	1.00		pCi/L	± 0.76	1	7/17/2023 3:33:00 PM
Yield	1					1	7/17/2023 3:33:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/27/2023 9:10:00 AM

Project: 23062071

Lab ID: 23070477-007

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-007

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.11	2.00	U	pCi/L	± 0.67	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.11	1.00	U	pCi/L	± 0.08	1	7/18/2023 9:09:00 AM
Yield	0.99					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	-0.03	1.00	U	pCi/L	± 0.59	1	7/17/2023 3:33:00 PM
Yield	1					1	7/17/2023 3:33:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,
Collection Date: 6/27/2023 10:35:00 AM

Project: 23062071

Lab ID: 23070477-008
Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-008

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.04	2.00	U	pCi/L	± 0.66	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.3	1.00	U	pCi/L	± 0.12	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.74	1.00	J	pCi/L	± 0.54	1	8/2/2023 3:10:00 PM
Yield	1					1	8/2/2023 3:10:00 PM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	
	MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds	
	ND	Not Detected	OG1		
	P	Second column confirmation exceeds	PL	Permit Limit	

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/27/2023 12:15:00 PM

Project: 23062071

Lab ID: 23070477-009

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-009

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.21	2.00	U	pCi/L	± 0.7	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.21	1.00	U	pCi/L	± 0.1	1	7/18/2023 9:09:00 AM
Yield	1					1	7/18/2023 9:09:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	-0.42	1.00	U	pCi/L	± 0.6	1	8/2/2023 3:10:00 PM
Yield	0.99					1	8/2/2023 3:10:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,
Collection Date: 6/27/2023 2:10:00 PM

Project: 23062071

Lab ID: 23070477-010
Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-010

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.54	2.00	U	pCi/L	± 0.6	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.23	1.00	U	pCi/L	± 0.1	1	7/21/2023 9:43:00 AM
Yield	1					1	7/21/2023 9:43:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.31	1.00	UQDR	pCi/L	± 0.5	1	7/20/2023 3:16:00 PM
Yield	1					1	7/20/2023 3:16:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/27/2023 3:20:00 PM

Project: 23062071

Lab ID: 23070477-011

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-011

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.53	2.00	U	pCi/L	± 0.74	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.18	1.00	U	pCi/L	± 0.09	1	7/21/2023 9:43:00 AM
Yield	1					1	7/21/2023 9:43:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.35	1.00	U	pCi/L	± 0.65	1	7/20/2023 3:16:00 PM
Yield	1					1	7/20/2023 3:16:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

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WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,

Collection Date: 6/27/2023 4:30:00 PM

Project: 23062071

Lab ID: 23070477-012

Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-012

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.12	2.00	U	pCi/L	± 0.72	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.27	1.00	U	pCi/L	± 0.11	1	7/21/2023 9:43:00 AM
Yield	1					1	7/21/2023 9:43:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.85	1.00	J	pCi/L	± 0.61	1	7/20/2023 3:16:00 PM
Yield	1					1	7/20/2023 3:16:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,
Collection Date: 6/27/2023 5:35:00 PM

Project: 23062071

Lab ID: 23070477-013
Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-013

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.25	2.00	U	pCi/L	± 0.8	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.33	1.00	U	pCi/L	± 0.12	1	7/21/2023 9:43:00 AM
Yield	1					1	7/21/2023 9:43:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.92	1.00	J	pCi/L	± 0.68	1	7/20/2023 3:16:00 PM
Yield	0.92					1	7/20/2023 3:16:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,
Collection Date: 6/27/2023 12:01:00 AM

Project: 23062071

Lab ID: 23070477-014
Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-014

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.72	2.00	U	pCi/L	± 0.75	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.11	1.00	U	pCi/L	± 0.08	1	7/21/2023 9:43:00 AM
Yield	0.96					1	7/21/2023 9:43:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.61	1.00	U	pCi/L	± 0.67	1	7/20/2023 3:16:00 PM
Yield	1					1	7/20/2023 3:16:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23070477**

Date Reported: **8/9/2023**

CLIENT: TEKLAB Inc,
Collection Date: 6/27/2023 12:02:00 AM

Project: 23062071

Lab ID: 23070477-015
Matrix: NON-POTABLE WATER

Client Sample ID: 23062071-015

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.13	2.00	U	pCi/L	± 0.59	1	8/7/2023 8:05:48 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **HDJ**
RADIUM-226 (EPA 903.0)							
Radium-226	-0.05	1.00	U	pCi/L	± 0.07	1	7/21/2023 9:43:00 AM
Yield	1					1	7/21/2023 9:43:00 AM
RAD226/228					**E904.0**	**E903-904**	Analyst: **HDJ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.13	1.00	U	pCi/L	± 0.52	1	7/20/2023 3:16:00 PM
Yield	1					1	7/20/2023 3:16:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66785**

Sample ID: **MB-66785** SampType: **MBLK** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167598**
Client ID: **PBW** Batch ID: **66785** TestNo: **E904.0** **E903-904** Analysis Date: **7/17/2023** SeqNo: **4496562**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						U
Yield	1.00			0	0						

Sample ID: **LCS-66785** SampType: **LCS** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167598**
Client ID: **LCSW** Batch ID: **66785** TestNo: **E904.0** **E903-904** Analysis Date: **7/17/2023** SeqNo: **4496563**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	4.19	1.00	5.000	0	83.8	70	130				
Yield	0.800			0	0						

Sample ID: **RLC-66785** SampType: **RLC** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167598**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E904.0** **E903-904** Analysis Date: **7/17/2023** SeqNo: **4496566**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.840	1.00	1.000	0	84.0	50	150				J
Yield	0.840			0	0						

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66785**

Sample ID: **RLCD-66785**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/12/2023**	RunNo: **167598**
Client ID: **BatchQC**	Batch ID: **66785**	TestNo: **E904.0**	**E903-904**	Analysis Date: **7/17/2023**	SeqNo: **4496567**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	4.24	1.00	1.000	0	424	50	150				S
Yield	0.890			0	0						

Sample ID: **23070127-001AMS**	SampType: **MS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/12/2023**	RunNo: **167598**
Client ID: **BatchQC**	Batch ID: **66785**	TestNo: **E904.0**	**E903-904**	Analysis Date: **7/17/2023**	SeqNo: **4496568**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	2.57	1.00	5.000	0	51.4	70	130				S
Yield	0.970			1.000	0						

Sample ID: **23070149-001ADUP**	SampType: **DUP**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/12/2023**	RunNo: **167598**
Client ID: **BatchQC**	Batch ID: **66785**	TestNo: **E904.0**	**E903-904**	Analysis Date: **7/17/2023**	SeqNo: **4496571**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	20	U
Yield	1.00			0	0			0.9400	6.19		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66785**

Sample ID: **MB-66785** SampType: **MBLK** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **PBW** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497012**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									U
Yield	1.00										

Sample ID: **LCS-66785** SampType: **LCS** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **LCSW** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497013**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.08	1.00	5.000	0	102	70	130				

Sample ID: **LCSD-66785** SampType: **LCSD** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **LCSS02** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497014**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.20	1.00	5.000	0	104	70	130	5.080	2.33	20	

Sample ID: **RLC-66785** SampType: **RLC** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497016**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66785**

Sample ID: **RLC-66785** SampType: **RLC** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497016**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.39	1.00	1.000	0	139	50	150				

Sample ID: **RLCD-66785** SampType: **RLC** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497017**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.05	1.00	1.000	0	105	50	150				

Sample ID: **23070127-001AMS** SampType: **MS** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497018**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	6.10	1.00	5.000	0	122	70	130				

Sample ID: **23070149-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497021**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	20	U

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66785**

Sample ID: **23070149-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497021**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Yield	1.00							1.000	0	0	

Sample ID: **23070155-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/12/2023** RunNo: **167616**
Client ID: **BatchQC** Batch ID: **66785** TestNo: **E903.0** **E903-904** Analysis Date: **7/18/2023** SeqNo: **4497023**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	20	U
Yield	1.00							1.000	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66816**

Sample ID: **23070477-010ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/13/2023** RunNo: **167622**
Client ID: **23062071-010** Batch ID: **66816** TestNo: **E904.0** **E903-904** Analysis Date: **7/20/2023** SeqNo: **4497251**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.97	1.00		0	0			0	200	30	JR
Yield	1			0	0			1.000	0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66816**

Sample ID: **MB-66816** SampType: **MBLK** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/13/2023** RunNo: **167622**
Client ID: **PBW** Batch ID: **66816** TestNo: **E904.0** **E903-904** Analysis Date: **7/20/2023** SeqNo: **4497240**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						U
Yield	1.00			0	0						

Sample ID: **LCS-66816** SampType: **LCS** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/13/2023** RunNo: **167622**
Client ID: **LCSW** Batch ID: **66816** TestNo: **E904.0** **E903-904** Analysis Date: **7/20/2023** SeqNo: **4497241**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	6.04	1.00	5.000	0	121	70	130				QLR
Yield	1.00			0	0						

Sample ID: **LCSD-66816** SampType: **LCSD** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/13/2023** RunNo: **167622**
Client ID: **LCSS02** Batch ID: **66816** TestNo: **E904.0** **E903-904** Analysis Date: **7/20/2023** SeqNo: **4497242**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.64	1.00	5.000	0	72.8	70	130	6.040	49.6	20	R
Yield	1.00			0	0			1.000	0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66816**

Sample ID: **RLC-66816**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167622**
Client ID: **BatchQC**	Batch ID: **66816**	TestNo: **E904.0**	**E903-904**	Analysis Date: **7/20/2023**	SeqNo: **4497244**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00	1.000	0	54.0	50	150				
Yield	0.220			0	0						

Sample ID: **23070591-001AMS**	SampType: **MS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167622**
Client ID: **BatchQC**	Batch ID: **66816**	TestNo: **E904.0**	**E903-904**	Analysis Date: **7/20/2023**	SeqNo: **4497246**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	2.03	1.00	5.000	0.9200	22.2	70	130				S
Yield	0.640			0.7800	0						

Sample ID: **23070592-001ADUP**	SampType: **DUP**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167622**
Client ID: **BatchQC**	Batch ID: **66816**	TestNo: **E904.0**	**E903-904**	Analysis Date: **7/20/2023**	SeqNo: **4497249**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.760	1.00		0	0			0	200	20	JR
Yield	0.950			0	0			1.000	5.13		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66816**

Sample ID: **23070477-010ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **7/13/2023** RunNo: **167641**
Client ID: **23062071-010** Batch ID: **66816** TestNo: **E903.0** **E903-904** Analysis Date: **7/21/2023** SeqNo: **4497507**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	0.12	1.00						0	0	30	U
Yield	0.99							1.000	1.01	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66816**

Sample ID: **MB-66816**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167641**
Client ID: **PBW**	Batch ID: **66816**	TestNo: **E903.0**	**E903-904**	Analysis Date: **7/21/2023**	SeqNo: **4497498**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									U
Yield	1.00										

Sample ID: **LCS-66816**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167641**
Client ID: **LCSW**	Batch ID: **66816**	TestNo: **E903.0**	**E903-904**	Analysis Date: **7/21/2023**	SeqNo: **4497499**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	6.33	1.00	5.000	0	127	70	130				

Sample ID: **LCSD-66816**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167641**
Client ID: **LCSS02**	Batch ID: **66816**	TestNo: **E903.0**	**E903-904**	Analysis Date: **7/21/2023**	SeqNo: **4497500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.86	1.00	5.000	0	117	70	130	6.330	7.71	20	

Sample ID: **RLC-66816**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167641**
Client ID: **BatchQC**	Batch ID: **66816**	TestNo: **E903.0**	**E903-904**	Analysis Date: **7/21/2023**	SeqNo: **4497502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **66816**

Sample ID: **RLC-66816**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167641**
Client ID: **BatchQC**	Batch ID: **66816**	TestNo: **E903.0**	**E903-904**	Analysis Date: **7/21/2023**	SeqNo: **4497502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.41	1.00	1.000	0	141	50	150				

Sample ID: **RLCD-66816**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **7/13/2023**	RunNo: **167641**
Client ID: **BatchQC**	Batch ID: **66816**	TestNo: **E903.0**	**E903-904**	Analysis Date: **7/21/2023**	SeqNo: **4497503**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.00	1.00	1.000	0	100	50	150				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **67186**

Sample ID: **MB-67186** SampType: **MBLK** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/25/2023** RunNo: **168446**
Client ID: **PBW** Batch ID: **67186** TestNo: **E904.0** **E903-904** Analysis Date: **8/2/2023** SeqNo: **4522176**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						U
Yield	0.780			0	0						

Sample ID: **LCS-67186** SampType: **LCS** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/25/2023** RunNo: **168446**
Client ID: **LCSW** Batch ID: **67186** TestNo: **E904.0** **E903-904** Analysis Date: **8/2/2023** SeqNo: **4522177**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.56	1.00	5.000	0	71.2	70	130				
Yield	1.00			0	0						

Sample ID: **LCSD-67186** SampType: **LCSD** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/25/2023** RunNo: **168446**
Client ID: **LCSS02** Batch ID: **67186** TestNo: **E904.0** **E903-904** Analysis Date: **8/2/2023** SeqNo: **4522178**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	4.06	1.00	5.000	0	81.2	70	130	3.560	13.1	20	
Yield	1.00			0	0			1.000	0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **67186**

Sample ID: **RLC-67186**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/25/2023**	RunNo: **168446**
Client ID: **BatchQC**	Batch ID: **67186**	TestNo: **E904.0**	**E903-904**	Analysis Date: **8/2/2023**	SeqNo: **4522180**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00	1.000	0	51.0	50	150				
Yield	0.640			0	0						

Sample ID: **23071399-001AMS**	SampType: **MS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/25/2023**	RunNo: **168446**
Client ID: **BatchQC**	Batch ID: **67186**	TestNo: **E904.0**	**E903-904**	Analysis Date: **8/2/2023**	SeqNo: **4522182**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.73	1.00	5.000	0	74.6	70	130				
Yield	0.860			1.000	0						

Sample ID: **23071400-001ADUP**	SampType: **DUP**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **7/25/2023**	RunNo: **168446**
Client ID: **BatchQC**	Batch ID: **67186**	TestNo: **E904.0**	**E903-904**	Analysis Date: **8/2/2023**	SeqNo: **4522185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.28	1.00		0	0			2.950	10.6	20	
Yield	1.00			0	0			1.000	0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23070477**

09-Aug-23

Client: TEKLAB Inc,
Project: 23062071 **BatchID:** **67186**

Sample ID: **23071401-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **7/25/2023** RunNo: **168446**
Client ID: **BatchQC** Batch ID: **67186** TestNo: **E904.0** **E903-904** Analysis Date: **8/2/2023** SeqNo: **4522187**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	20	U
Yield	1.00			0	0			1.000	0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Revision v1

23070477

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Cooler Temp: Sampler: QC Level: 3

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Comments: **Please issue reports and invoices via email only**
Please analyze for Radium (226, 228, and combined) by method EPA903.0/904.0
on standard TAT Please include negative values (no ND).
Batch QC and CCR EDD are required. Receipt summary requested.

Project# 23062071

Contact: Elizabeth Hurley Email: ehurley@teklabinc.com
Requested Due Date: 20 business days or less Billing/PO: 34627
Phone: 618-344-1004 ext. 33

State of Origin: MO IL
TE GM 6/28/23

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226	Radium 228	Combined Radium										
	23062071-001	6/26/23 9.00	HNO3	Groundwater	✔	✔	✔	pH	1	CPM		31	36				
	23062071-002	6/26/23 12.10	HNO3	Groundwater	✔	✔	✔		1			33	28				
	23062071-003	6/26/23 14.15	HNO3	Groundwater	✔	✔	✔		1			32	26				
	23062071-004	6/26/23 15.20	HNO3	Groundwater	✔	✔	✔		1			43	41				
	23062071-005	6/26/23 17.00	HNO3	Groundwater	✔	✔	✔		1			28	27				
	23062071-006	6/26/23 18.45	HNO3	Groundwater	✔	✔	✔		1			32	33				
	23062071-007	6/27/23 9.10	HNO3	Groundwater	✔	✔	✔		1			28	31				
	23062071-008	6/27/23 10.35	HNO3	Groundwater	✔	✔	✔		1			41	16				
	23062071-009	6/27/23 12.15	HNO3	Groundwater	✔	✔	✔		1			18	21				
	23062071-010	6/27/23 14.10	HNO3	Groundwater	✔	✔	✔		1			33	43				
	23062071-011	6/27/23 15.20	HNO3	Groundwater	✔	✔	✔		1			19	17				

*Relinquished By	Date/Time	Received By	Date/Time
Allison Cole (FedEx)	6/28/23		6/29/23 1330

20.7+0.0=20.7 Fedex cooler

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization. and proprietary rights. Teklab, Inc. protects clients' confidential information as directed by local, state or federal laws. (Teklab QAM Section 9.1, TNI V1 M2 Section 4.1.5 c)

SubCocRevA 3/2/2016

TEKLAB, INC. Chain of Custody

23070477

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: Sampler: QC Level: 3

Comments: **Please issue reports and invoices via email only**
Please analyze for Radium (226, 228, and combined) by method EPA903.0/904.0
on standard TAT Please include negative values (no ND).
Batch QC and CCR EDD are required. Receipt summary requested.

Project# 23062071

Contact: Elizabeth Hurley Email: ehurley@teklabinc.com
Requested Due Date: 20 business days or less Billing/PO: 34627
Phone: 618-344-1004 ext. 33

State of Origin: MO IL
TE Clerk 6/28/23

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226	Radium 228	Combined Radium											
	23062071-012	6/27/23 16.30	HNO3	Groundwater	✔	✔	✔	PH	1,1	CP/M	31,32							
	23062071-013	6/27/23 17.35	HNO3	Groundwater	✔	✔	✔		1,1		28,27							
	23062071-014	6/27/23 0001	HNO3	Groundwater	✔	✔	✔		1,1		35,31							
	23062071-015	6/27/23 0002	HNO3	Groundwater	✔	✔	✔	✔	1,1		36,28							
			HNO3	Groundwater														
			HNO3	Groundwater														
			HNO3	Groundwater														
			HNO3	Groundwater														
			HNO3	Groundwater														
			HNO3	Groundwater														
			HNO3	Groundwater														

*Relinquished By	Date/Time	Received By	Date/Time
Allison Cole (Fedex)	6/28/23		

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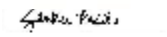
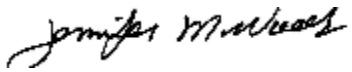
SubCocRevA 3/2/2016

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: **TEK-IL-62234-A** Work Order Number: **23070477** RcptNo: **1**

Logged by:	**Anthony W. Britton**	**7/7/2023 1:30:00 PM**	
Completed By:	**Jacqueline Rasile**	**7/11/2023 12:09:49 AM**	
Reviewed By:	**Jennifer Woolf**	**7/12/2023 10:24:31 AM**	

Chain of Custody

1.	Were seals intact?	Yes ☑	No ☐	Not Present ☐
2.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3.	How was the sample delivered?	FedEx		

Log In

4.	Coolers are present?	Yes ☑	No ☐	NA ☐
5.	Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
6.	Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☐	NA ☑
7.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
8.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
9.	Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
10.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
11.	Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes ☐	No ☐	No VOA Vials ☑
12.	Were any sample containers received broken?	Yes ☐	No ☑	
13.	Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
14.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
15.	Is it clear what analyses were requested?	Yes ☑	No ☐	
16.	Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	20.7	Good	Not Present			

October 30, 2023

Clay Sansoucie
ERM
1968 Craig Road
Suite 100
St. Louis, MO 63146
TEL: (314) 956-0269
FAX:

Illinois	100226
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: 0599247 **WorkOrder:** 23091500

Dear Clay Sansoucie:

TEKLAB, INC received 15 samples on 9/21/2023 9:45:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

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

Sincerely,

Elizabeth A. Hurley
Director of Customer Service
(618)344-1004 ex 33
ehurley@teklabinc.com

Report Contents

Client: ERM
Client Project: 0599247

Work Order: 23091500
Report Date: 30-Oct-23

This reporting package includes the following:

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Abbr	Definition
*	Analytes on report marked with an asterisk are not NELAP accredited
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
CRQL	A Client Requested Quantitation Limit is a reporting limit that varies according to customer request. The CRQL may not be less than the MDL.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilution factors.
DNI	Did not ignite
DUP	Laboratory duplicate is a replicate aliquot prepared under the same laboratory conditions and independently analyzed to obtain a measure of precision.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample is a sample matrix, free from the analytes of interest,spiked with verified known amounts of analytes and analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MBLK	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	"The method detection limit is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results."
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
NC	Data is not acceptable for compliance purposes
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions.
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TIC	Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
TNTC	Too numerous to count (> 200 CFU)

Definitions

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Qualifiers

# -	Unknown hydrocarbon	B -	Analyte detected in associated Method Blank
C -	RL shown is a Client Requested Quantitation Limit	E -	Value above quantitation range
H -	Holding times exceeded	I -	Associated internal standard was outside method criteria
J -	Analyte detected below quantitation limits	M -	Manual Integration used to determine area response
ND -	Not Detected at the Reporting Limit	R -	RPD outside accepted recovery limits
S -	Spike Recovery outside recovery limits	T -	TIC(Tentatively identified compound)
X -	Value exceeds Maximum Contaminant Level		

Client: ERM

Work Order: 23091500

Client Project: 0599247

Report Date: 30-Oct-23

Cooler Receipt Temp: 3.4 °C

Ra226/228 analyses were performed by Summit Environmental Technologies, Inc. See attached report for results and QC.

Locations

Collinsville

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email jhriley@teklabinc.com

Springfield

Address 3920 Pintail Dr
Springfield, IL 62711-9415
Phone (217) 698-1004
Fax (217) 698-1005
Email KKlostermann@teklabinc.com

Kansas City

Address 8421 Nieman Road
Lenexa, KS 66214
Phone (913) 541-1998
Fax (913) 541-1998
Email jhriley@teklabinc.com

Collinsville Air

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email EHurley@teklabinc.com

Chicago

Address 1319 Butterfield Rd.
Downers Grove, IL 60515
Phone (630) 324-6855
Fax
Email arenner@teklabinc.com

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2024	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2024	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2024	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2024	Collinsville
Kentucky	UST	0073		1/31/2024	Collinsville
Missouri	MDNR	00930		5/31/2023	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-001 **Client Sample ID:** APW-03-WG-20230919

Matrix: GROUNDWATER **Collection Date:** 09/19/2023 11:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**636**	mg/L	1	09/21/2023 15:53	R336743
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**280**	mg/L	10	09/22/2023 17:36	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.84**		1	09/27/2023 14:06	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.25**	mg/L	1	09/26/2023 11:11	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**16**	mg/L	1	09/22/2023 17:30	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:04	212291
Arsenic	NELAP	0.0010		**0.0019**	mg/L	5	09/25/2023 18:04	212291
Barium	NELAP	0.0010		**0.136**	mg/L	5	09/25/2023 18:04	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 13:29	212291
Boron	NELAP	0.0250		**4.11**	mg/L	5	09/25/2023 18:04	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:04	212291
Calcium	NELAP	0.125		**137**	mg/L	5	09/29/2023 14:29	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 18:04	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:04	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:04	212291
Lithium	*	0.0030		**0.0406**	mg/L	5	10/02/2023 13:29	212291
Molybdenum	*	0.0015		**0.0487**	mg/L	5	09/25/2023 18:04	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:04	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 18:04	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:46	212304
Arsenic	NELAP	0.0010		**0.0017**	mg/L	5	09/26/2023 23:46	212304
Barium	NELAP	0.0010		**0.137**	mg/L	5	09/26/2023 23:46	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:46	212304
Boron	NELAP	0.0250	S	**4.19**	mg/L	5	09/28/2023 10:48	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:46	212304
Calcium	NELAP	0.125	S	**124**	mg/L	5	09/26/2023 23:46	212304
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/26/2023 23:46	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:46	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:46	212304
Lithium	*	0.0030		**0.0312**	mg/L	5	09/26/2023 23:46	212304
Molybdenum	*	0.0015		**0.0558**	mg/L	5	09/26/2023 23:46	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:46	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/26/2023 23:46	212304
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:11	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-002 **Client Sample ID:** APW-08-WG-20230919

Matrix: GROUNDWATER **Collection Date:** 09/19/2023 12:55

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**440**	mg/L	2.5	09/21/2023 15:54	R336743
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**23**	mg/L	1	09/22/2023 17:54	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.16**		1	09/27/2023 14:07	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.26**	mg/L	1	09/26/2023 11:13	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**10**	mg/L	1	09/22/2023 17:54	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:23	212291
Arsenic	NELAP	0.0010		**0.0014**	mg/L	5	09/25/2023 18:23	212291
Barium	NELAP	0.0010		**0.236**	mg/L	5	10/02/2023 14:13	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 14:13	212291
Boron	NELAP	0.0250		**0.117**	mg/L	5	09/25/2023 18:23	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:23	212291
Calcium	NELAP	0.125	S	**94.1**	mg/L	5	09/29/2023 16:11	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 18:23	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:23	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:23	212291
Lithium	*	0.0030		**0.0220**	mg/L	5	10/02/2023 14:13	212291
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/25/2023 18:23	212291
Selenium	NELAP	0.0010		**0.0121**	mg/L	5	09/25/2023 18:23	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/29/2023 16:11	212291
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:29	212304
Arsenic	NELAP	0.0010		**0.0018**	mg/L	5	09/26/2023 23:29	212304
Barium	NELAP	0.0010		**0.199**	mg/L	5	09/26/2023 23:29	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:29	212304
Boron	NELAP	0.0250		**0.116**	mg/L	5	09/28/2023 9:13	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:29	212304
Calcium	NELAP	0.125		**86.4**	mg/L	5	09/26/2023 23:29	212304
Chromium	NELAP	0.0015		**0.0031**	mg/L	5	09/26/2023 23:29	212304
Cobalt	NELAP	0.0010		**0.0014**	mg/L	5	09/26/2023 23:29	212304
Lead	NELAP	0.0010		**0.0015**	mg/L	5	09/26/2023 23:29	212304
Lithium	*	0.0030		**0.0177**	mg/L	5	09/26/2023 23:29	212304
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/26/2023 23:29	212304
Selenium	NELAP	0.0010		**0.0122**	mg/L	5	09/26/2023 23:29	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/26/2023 23:29	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:13	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-003 **Client Sample ID:** APW-07-WG-20230919

Matrix: GROUNDWATER **Collection Date:** 09/19/2023 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**740**	mg/L	2.5	09/21/2023 15:54	R336743
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**44**	mg/L	1	09/22/2023 18:02	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.94**		1	09/27/2023 14:09	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.18**	mg/L	1	09/26/2023 11:15	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**9**	mg/L	1	09/22/2023 18:02	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:10	212291
Arsenic	NELAP	0.0010		**0.0013**	mg/L	5	09/29/2023 14:35	212291
Barium	NELAP	0.0010		**0.336**	mg/L	5	09/25/2023 18:10	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 13:35	212291
Boron	NELAP	0.0250		**0.192**	mg/L	5	09/25/2023 18:10	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:10	212291
Calcium	NELAP	0.125		**196**	mg/L	5	09/29/2023 14:35	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 18:10	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:10	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:10	212291
Lithium	*	0.0030		**0.0184**	mg/L	5	10/02/2023 13:35	212291
Molybdenum	*	0.0015		**0.0029**	mg/L	5	09/25/2023 18:10	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:10	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 18:10	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:35	212304
Arsenic	NELAP	0.0010		**0.0018**	mg/L	5	09/26/2023 23:35	212304
Barium	NELAP	0.0010		**0.303**	mg/L	5	09/26/2023 23:35	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:35	212304
Boron	NELAP	0.0250		**0.181**	mg/L	5	09/28/2023 9:18	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:35	212304
Calcium	NELAP	0.125		**161**	mg/L	5	09/26/2023 23:35	212304
Chromium	NELAP	0.0015		**0.0057**	mg/L	5	09/26/2023 23:35	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:35	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:35	212304
Lithium	*	0.0030		**0.0141**	mg/L	5	09/26/2023 23:35	212304
Molybdenum	*	0.0015		**0.0029**	mg/L	5	09/26/2023 23:35	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:35	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/26/2023 23:35	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:20	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-004 **Client Sample ID:** APW-10S-WG-20230919

Matrix: GROUNDWATER **Collection Date:** 09/19/2023 14:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**775**	mg/L	2.5	09/21/2023 16:05	R336743
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10	S	**< 10**	mg/L	1	09/22/2023 18:13	R336796
Matrix spike did not recover within control limits due to matrix interference.								
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.17**		1	09/27/2023 14:12	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.16**	mg/L	1	09/26/2023 11:16	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**15**	mg/L	1	09/22/2023 18:13	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:16	212291
Arsenic	NELAP	0.0010		**0.176**	mg/L	5	09/25/2023 18:16	212291
Barium	NELAP	0.0010		**0.567**	mg/L	5	09/25/2023 18:16	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 13:42	212291
Boron	NELAP	0.0250		**0.571**	mg/L	5	09/25/2023 18:16	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:16	212291
Calcium	NELAP	0.125		**151**	mg/L	5	09/29/2023 15:26	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 18:16	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:16	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:16	212291
Lithium	*	0.0030		**0.0349**	mg/L	5	10/02/2023 13:42	212291
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/25/2023 18:16	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 18:16	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 18:16	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:40	212304
Arsenic	NELAP	0.0010		**0.174**	mg/L	5	09/26/2023 23:40	212304
Barium	NELAP	0.0010		**0.591**	mg/L	5	09/26/2023 23:40	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:40	212304
Boron	NELAP	0.0250		**0.553**	mg/L	5	09/28/2023 9:22	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:40	212304
Calcium	NELAP	0.125		**134**	mg/L	5	09/26/2023 23:40	212304
Chromium	NELAP	0.0015		**0.0087**	mg/L	5	09/26/2023 23:40	212304
Cobalt	NELAP	0.0010		**0.0021**	mg/L	5	09/26/2023 23:40	212304
Lead	NELAP	0.0010		**0.0031**	mg/L	5	09/26/2023 23:40	212304
Lithium	*	0.0030		**0.0301**	mg/L	5	09/26/2023 23:40	212304
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/26/2023 23:40	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 23:40	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/26/2023 23:40	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:22	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/23/2023 14:46	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/23/2023 14:46	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-005 **Client Sample ID:** APW-10D-WG-20230919

Matrix: GROUNDWATER **Collection Date:** 09/19/2023 16:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**468**	mg/L	1	09/21/2023 16:05	R336743
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**31**	mg/L	1	09/22/2023 18:48	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.22**		1	09/27/2023 14:13	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.11**	mg/L	1	09/26/2023 11:18	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**10**	mg/L	1	09/22/2023 18:47	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:48	212291
Arsenic	NELAP	0.0010		**0.0011**	mg/L	5	09/25/2023 20:48	212291
Barium	NELAP	0.0010		**0.355**	mg/L	5	09/25/2023 20:48	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 13:48	212291
Boron	NELAP	0.0250		**0.0639**	mg/L	5	09/29/2023 15:33	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:48	212291
Calcium	NELAP	0.125		**116**	mg/L	5	09/29/2023 15:33	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 20:48	212291
Cobalt	NELAP	0.0010		**0.0026**	mg/L	5	09/25/2023 20:48	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:48	212291
Lithium	*	0.0030		**0.0200**	mg/L	5	10/02/2023 13:48	212291
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/25/2023 20:48	212291
Selenium	NELAP	0.0010		**0.0016**	mg/L	5	09/25/2023 20:48	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 20:48	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:31	212304
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	09/27/2023 0:31	212304
Barium	NELAP	0.0010		**0.339**	mg/L	5	09/27/2023 0:31	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:31	212304
Boron	NELAP	0.0250		**0.0660**	mg/L	5	09/28/2023 9:26	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:31	212304
Calcium	NELAP	0.125		**118**	mg/L	5	09/27/2023 0:31	212304
Chromium	NELAP	0.0015		**0.0042**	mg/L	5	09/27/2023 0:31	212304
Cobalt	NELAP	0.0010		**0.0031**	mg/L	5	09/27/2023 0:31	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:31	212304
Lithium	*	0.0030		**0.0148**	mg/L	5	09/28/2023 9:26	212304
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/27/2023 0:31	212304
Selenium	NELAP	0.0010		**0.0013**	mg/L	5	09/27/2023 0:31	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 0:31	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:24	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-006 **Client Sample ID:** APW-06S-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 8:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**565**	mg/L	2.5	09/22/2023 10:42	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**221**	mg/L	10	09/22/2023 19:00	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.21**		1	09/27/2023 14:47	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.30**	mg/L	1	09/26/2023 11:20	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**20**	mg/L	1	09/22/2023 18:55	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:54	212291
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:54	212291
Barium	NELAP	0.0010		**0.216**	mg/L	5	09/25/2023 20:54	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 13:54	212291
Boron	NELAP	0.0250		**6.65**	mg/L	5	09/29/2023 15:39	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:54	212291
Calcium	NELAP	0.125		**107**	mg/L	5	09/29/2023 15:39	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 20:54	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:54	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:54	212291
Lithium	*	0.0030		**0.0487**	mg/L	5	10/02/2023 13:54	212291
Molybdenum	*	0.0015		**0.234**	mg/L	5	09/25/2023 20:54	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:54	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 20:54	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:37	212304
Arsenic	NELAP	0.0010		**0.0012**	mg/L	5	09/27/2023 0:37	212304
Barium	NELAP	0.0010		**0.206**	mg/L	5	09/27/2023 0:37	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:37	212304
Boron	NELAP	0.0250		**5.79**	mg/L	5	09/28/2023 10:19	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:37	212304
Calcium	NELAP	0.125		**92.7**	mg/L	5	09/27/2023 0:37	212304
Chromium	NELAP	0.0015		**0.0067**	mg/L	5	09/27/2023 0:37	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:37	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:37	212304
Lithium	*	0.0030		**0.0369**	mg/L	5	09/28/2023 10:19	212304
Molybdenum	*	0.0015		**0.225**	mg/L	5	09/27/2023 0:37	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:37	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 0:37	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:26	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/23/2023 14:46	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/23/2023 14:46	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-007 **Client Sample ID:** APW-06D-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 10:05

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**565**	mg/L	2.5	09/22/2023 10:42	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**218**	mg/L	10	09/22/2023 19:08	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.30**		1	09/27/2023 14:50	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.22**	mg/L	1	09/26/2023 11:22	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**16**	mg/L	1	09/22/2023 19:03	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:00	212291
Arsenic	NELAP	0.0010		**0.0100**	mg/L	5	09/25/2023 21:00	212291
Barium	NELAP	0.0010		**0.121**	mg/L	5	09/25/2023 21:00	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 14:01	212291
Boron	NELAP	0.0250		**3.77**	mg/L	5	09/29/2023 15:45	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:00	212291
Calcium	NELAP	0.125		**114**	mg/L	5	09/29/2023 15:45	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 21:00	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:00	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:00	212291
Lithium	*	0.0030		**0.0197**	mg/L	5	10/02/2023 14:01	212291
Molybdenum	*	0.0015		**0.0559**	mg/L	5	09/25/2023 21:00	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:00	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 21:00	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:42	212304
Arsenic	NELAP	0.0010		**0.0109**	mg/L	5	09/27/2023 0:42	212304
Barium	NELAP	0.0010		**0.128**	mg/L	5	09/27/2023 0:42	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:42	212304
Boron	NELAP	0.0250		**3.81**	mg/L	5	09/28/2023 10:23	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:42	212304
Calcium	NELAP	0.125		**106**	mg/L	5	09/27/2023 0:42	212304
Chromium	NELAP	0.0015		**0.0727**	mg/L	5	09/27/2023 0:42	212304
Cobalt	NELAP	0.0010		**0.0035**	mg/L	5	09/27/2023 0:42	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:42	212304
Lithium	*	0.0030		**0.0169**	mg/L	5	09/28/2023 10:23	212304
Molybdenum	*	0.0015		**0.0672**	mg/L	5	09/27/2023 0:42	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:42	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 0:42	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:29	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-008 **Client Sample ID:** APW-05R-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 11:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**680**	mg/L	2.5	09/22/2023 10:42	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**343**	mg/L	10	09/22/2023 19:17	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.36**		1	09/27/2023 14:52	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.35**	mg/L	1	09/26/2023 11:31	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**14**	mg/L	1	09/22/2023 19:11	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:07	212291
Arsenic	NELAP	0.0010		**0.0023**	mg/L	5	09/25/2023 21:07	212291
Barium	NELAP	0.0010		**0.167**	mg/L	5	09/25/2023 21:07	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 14:07	212291
Boron	NELAP	0.0250		**7.91**	mg/L	5	09/29/2023 15:52	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:07	212291
Calcium	NELAP	0.125		**118**	mg/L	5	09/29/2023 15:52	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 21:07	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:07	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:07	212291
Lithium	*	0.0030		**0.0624**	mg/L	5	10/02/2023 14:07	212291
Molybdenum	*	0.0015		**0.235**	mg/L	5	09/25/2023 21:07	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:07	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 21:07	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:48	212304
Arsenic	NELAP	0.0010		**0.0028**	mg/L	5	09/27/2023 0:48	212304
Barium	NELAP	0.0010		**0.162**	mg/L	5	09/27/2023 0:48	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:48	212304
Boron	NELAP	0.0250		**7.12**	mg/L	5	09/28/2023 10:27	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:48	212304
Calcium	NELAP	0.125		**105**	mg/L	5	09/27/2023 0:48	212304
Chromium	NELAP	0.0015		**0.0031**	mg/L	5	09/27/2023 0:48	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:48	212304
Lead	NELAP	0.0010		**0.0026**	mg/L	5	09/27/2023 0:48	212304
Lithium	*	0.0030		**0.0367**	mg/L	5	09/28/2023 10:27	212304
Molybdenum	*	0.0015		**0.223**	mg/L	5	09/27/2023 0:48	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:48	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 0:48	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:31	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-009 **Client Sample ID:** APW-09-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 14:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**372**	mg/L	1	09/22/2023 11:08	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**32**	mg/L	1	09/22/2023 19:20	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.56**		1	09/27/2023 14:56	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.20**	mg/L	1	09/26/2023 11:33	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**11**	mg/L	1	09/22/2023 19:19	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:13	212291
Arsenic	NELAP	0.0010		**0.0022**	mg/L	5	09/25/2023 21:13	212291
Barium	NELAP	0.0010		**0.114**	mg/L	5	09/25/2023 21:13	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 15:17	212291
Boron	NELAP	0.0250		**0.234**	mg/L	5	09/29/2023 15:58	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:13	212291
Calcium	NELAP	0.125		**81.0**	mg/L	5	09/29/2023 15:58	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 21:13	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:13	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:13	212291
Lithium	*	0.0030		**0.0196**	mg/L	5	10/02/2023 15:17	212291
Molybdenum	*	0.0015		**0.0167**	mg/L	5	09/25/2023 21:13	212291
Selenium	NELAP	0.0010		**0.0155**	mg/L	5	09/25/2023 21:13	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 21:13	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:53	212304
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	09/27/2023 0:53	212304
Barium	NELAP	0.0010		**0.120**	mg/L	5	09/27/2023 0:53	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:53	212304
Boron	NELAP	0.0250		**0.209**	mg/L	5	09/28/2023 10:31	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:53	212304
Calcium	NELAP	0.125		**69.5**	mg/L	5	09/27/2023 0:53	212304
Chromium	NELAP	0.0015		**0.0018**	mg/L	5	09/27/2023 0:53	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:53	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:53	212304
Lithium	*	0.0030		**0.0134**	mg/L	5	09/28/2023 10:31	212304
Molybdenum	*	0.0015		**0.0162**	mg/L	5	09/27/2023 0:53	212304
Selenium	NELAP	0.0010		**0.0153**	mg/L	5	09/27/2023 0:53	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 0:53	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:33	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-010 **Client Sample ID:** APW-02-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 12:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**845**	mg/L	2.5	09/22/2023 11:09	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**460**	mg/L	10	09/22/2023 19:49	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.15**		1	09/27/2023 14:58	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.24**	mg/L	1	09/26/2023 11:35	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**7**	mg/L	1	09/22/2023 19:43	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:19	212291
Arsenic	NELAP	0.0010		**0.0072**	mg/L	5	09/25/2023 21:19	212291
Barium	NELAP	0.0010		**0.133**	mg/L	5	09/25/2023 21:19	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 15:23	212291
Boron	NELAP	0.0250		**8.91**	mg/L	5	09/29/2023 16:04	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:19	212291
Calcium	NELAP	0.125		**151**	mg/L	5	09/29/2023 16:04	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 21:19	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:19	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:19	212291
Lithium	*	0.0030		**0.0583**	mg/L	5	10/02/2023 15:23	212291
Molybdenum	*	0.0015		**0.214**	mg/L	5	09/25/2023 21:19	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:19	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 21:19	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:59	212304
Arsenic	NELAP	0.0010		**0.0093**	mg/L	5	09/27/2023 0:59	212304
Barium	NELAP	0.0010		**0.152**	mg/L	5	09/27/2023 0:59	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:59	212304
Boron	NELAP	0.0250		**8.24**	mg/L	5	09/28/2023 10:35	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:59	212304
Calcium	NELAP	0.125		**132**	mg/L	5	09/27/2023 0:59	212304
Chromium	NELAP	0.0015		**0.0080**	mg/L	5	09/27/2023 0:59	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:59	212304
Lead	NELAP	0.0010		**0.0020**	mg/L	5	09/27/2023 0:59	212304
Lithium	*	0.0030		**0.0422**	mg/L	5	09/28/2023 10:35	212304
Molybdenum	*	0.0015		**0.198**	mg/L	5	09/27/2023 0:59	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 0:59	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 0:59	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:35	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-011 **Client Sample ID:** APW-01R-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 15:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**355**	mg/L	2.5	09/22/2023 11:09	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		**79**	mg/L	5	09/29/2023 16:21	R337145
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.66**		1	09/28/2023 9:40	R336991
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.17**	mg/L	1	09/26/2023 11:36	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**5**	mg/L	1	09/22/2023 19:51	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:25	212291
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	09/25/2023 21:25	212291
Barium	NELAP	0.0010		**0.210**	mg/L	5	09/25/2023 21:25	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 15:30	212291
Boron	NELAP	0.0250		**0.204**	mg/L	5	09/29/2023 17:14	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:25	212291
Calcium	NELAP	0.125		**72.1**	mg/L	5	09/29/2023 17:14	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 21:25	212291
Cobalt	NELAP	0.0010		**0.0012**	mg/L	5	09/25/2023 21:25	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 21:25	212291
Lithium	*	0.0030		**0.0211**	mg/L	5	10/02/2023 15:30	212291
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/25/2023 21:25	212291
Selenium	NELAP	0.0010		**0.0037**	mg/L	5	09/25/2023 21:25	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 21:25	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:10	212304
Arsenic	NELAP	0.0010		**0.0029**	mg/L	5	09/27/2023 1:10	212304
Barium	NELAP	0.0010		**0.202**	mg/L	5	09/27/2023 1:10	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:10	212304
Boron	NELAP	0.0250		**0.180**	mg/L	5	09/28/2023 11:29	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:10	212304
Calcium	NELAP	0.125	S	**59.2**	mg/L	5	09/27/2023 1:10	212304
Chromium	NELAP	0.0015		**0.0085**	mg/L	5	09/27/2023 1:10	212304
Cobalt	NELAP	0.0010		**0.0041**	mg/L	5	09/27/2023 1:10	212304
Lead	NELAP	0.0010		**0.0026**	mg/L	5	09/27/2023 1:10	212304
Lithium	*	0.0030		**0.0147**	mg/L	5	09/28/2023 11:29	212304
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/27/2023 1:10	212304
Selenium	NELAP	0.0010		**0.0037**	mg/L	5	09/27/2023 1:10	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 1:10	212304
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:38	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-012 **Client Sample ID:** APW-04-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 16:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**476**	mg/L	1	09/22/2023 11:10	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	20		**66**	mg/L	2	09/27/2023 13:00	R337008
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.56**		1	09/28/2023 9:43	R336991
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.15**	mg/L	1	09/26/2023 11:38	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**9**	mg/L	1	09/22/2023 20:02	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:04	212291
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	09/25/2023 20:04	212291
Barium	NELAP	0.0010		**0.138**	mg/L	5	09/25/2023 20:04	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 15:49	212291
Boron	NELAP	0.0250		**0.591**	mg/L	5	09/25/2023 20:04	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:04	212291
Calcium	NELAP	0.125	S	**101**	mg/L	5	09/29/2023 17:46	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 20:04	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:04	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 20:04	212291
Lithium	*	0.0030		**0.0411**	mg/L	5	10/02/2023 15:49	212291
Molybdenum	*	0.0015		**0.0367**	mg/L	5	09/25/2023 20:04	212291
Selenium	NELAP	0.0010		**0.0096**	mg/L	5	09/25/2023 20:04	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 20:04	212291
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:04	212304
Arsenic	NELAP	0.0010		**0.0019**	mg/L	5	09/27/2023 1:04	212304
Barium	NELAP	0.0010		**0.131**	mg/L	5	09/27/2023 1:04	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:04	212304
Boron	NELAP	0.0250		**0.572**	mg/L	5	09/28/2023 10:39	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:04	212304
Calcium	NELAP	0.125		**87.9**	mg/L	5	09/27/2023 1:04	212304
Chromium	NELAP	0.0015		**0.0023**	mg/L	5	09/27/2023 1:04	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:04	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 1:04	212304
Lithium	*	0.0030		**0.0299**	mg/L	5	09/28/2023 10:39	212304
Molybdenum	*	0.0015		**0.0299**	mg/L	5	09/27/2023 1:04	212304
Selenium	NELAP	0.0010		**0.0090**	mg/L	5	09/27/2023 1:04	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 1:04	212304
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/26/2023 15:40	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-013 **Client Sample ID:** EB-01-WQ-20230919

Matrix: GROUNDWATER **Collection Date:** 09/19/2023 8:40

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**< 20**	mg/L	1	09/21/2023 16:06	R336743
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	09/22/2023 20:36	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**5.50**		1	09/27/2023 15:03	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**< 0.10**	mg/L	1	09/26/2023 11:40	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**< 4**	mg/L	1	09/22/2023 20:37	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 15:36	212291
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	09/25/2023 19:19	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Calcium	NELAP	0.125		**0.464**	mg/L	5	09/29/2023 17:21	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 19:19	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Lithium	*	0.0030		**< 0.0030**	mg/L	5	10/02/2023 15:36	212291
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/25/2023 19:19	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:19	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 19:19	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	09/28/2023 10:44	212304
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Calcium	NELAP	0.125		**< 0.125**	mg/L	5	09/27/2023 2:12	212304
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/27/2023 2:12	212304
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Lithium	*	0.0030		**< 0.0030**	mg/L	5	09/27/2023 2:12	212304
Molybdenum	*	0.0015		**< 0.0015**	mg/L	5	09/27/2023 2:12	212304
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/27/2023 2:12	212304
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/27/2023 2:12	212304
CCV recovered outside the upper control limits for Li. Sample results are below the reporting limit. Data is reportable per the TNI standard.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**0.00119**	mg/L	1	09/27/2023 9:48	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-014 **Client Sample ID:** DUP-01-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 0:01

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**710**	mg/L	2.5	09/22/2023 11:10	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**333**	mg/L	10	09/22/2023 20:50	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.36**		1	09/27/2023 15:00	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.34**	mg/L	1	09/26/2023 11:43	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**14**	mg/L	1	09/22/2023 20:45	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:26	212291
Arsenic	NELAP	0.0010		**0.0024**	mg/L	5	09/25/2023 19:26	212291
Barium	NELAP	0.0010		**0.172**	mg/L	5	09/25/2023 19:26	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 15:42	212291
Boron	NELAP	0.0250		**8.05**	mg/L	5	09/25/2023 19:26	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:26	212291
Calcium	NELAP	0.125		**119**	mg/L	5	09/29/2023 17:27	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 19:26	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:26	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:26	212291
Lithium	*	0.0030		**0.0509**	mg/L	5	10/02/2023 15:42	212291
Molybdenum	*	0.0015		**0.233**	mg/L	5	09/25/2023 19:26	212291
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:26	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 19:26	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/23/2023 5:57	212305
Arsenic	NELAP	0.0010		**0.0026**	mg/L	5	09/26/2023 7:25	212305
Barium	NELAP	0.0010		**0.158**	mg/L	5	09/23/2023 5:57	212305
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 7:25	212305
Boron	NELAP	0.0250	S	**8.33**	mg/L	5	09/29/2023 14:42	212305
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/23/2023 5:57	212305
Calcium	NELAP	0.125	S	**126**	mg/L	5	09/29/2023 14:42	212305
Chromium	NELAP	0.0015		**0.0016**	mg/L	5	10/02/2023 12:45	212305
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 7:25	212305
Lead	NELAP	0.0010		**0.0021**	mg/L	5	09/28/2023 1:32	212305
Lithium	*	0.0030		**0.0425**	mg/L	5	10/02/2023 12:45	212305
Molybdenum	*	0.0015		**0.235**	mg/L	5	09/26/2023 7:25	212305
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 7:25	212305
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/23/2023 5:57	212305

Matrix spike control limits are not applicable due to high sample/spike ratio.

CCV recovered outside the upper control limits for TL. Sample results are below the reporting limit. Data is reportable per the TNI standard.

SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/27/2023 9:50	212412
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/13/2023 14:22	R338467

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Lab ID: 23091500-015 **Client Sample ID:** DUP-02-WG-20230920

Matrix: GROUNDWATER **Collection Date:** 09/20/2023 0:02

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**386**	mg/L	1	09/22/2023 11:31	R336815
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**31**	mg/L	1	09/22/2023 20:53	R336796
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.65**		1	09/27/2023 15:05	R336927
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.19**	mg/L	1	09/26/2023 11:46	R336875
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**11**	mg/L	1	09/22/2023 20:53	R336801
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:32	212291
Arsenic	NELAP	0.0010		**0.0021**	mg/L	5	09/25/2023 19:32	212291
Barium	NELAP	0.0010		**0.117**	mg/L	5	09/25/2023 19:32	212291
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	10/02/2023 16:33	212291
Boron	NELAP	0.0250		**0.236**	mg/L	5	09/25/2023 19:32	212291
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:32	212291
Calcium	NELAP	0.125		**81.1**	mg/L	5	09/29/2023 17:33	212291
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/25/2023 19:32	212291
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:32	212291
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/25/2023 19:32	212291
Lithium	*	0.0030		**0.0184**	mg/L	5	10/02/2023 16:33	212291
Molybdenum	*	0.0015		**0.0173**	mg/L	5	09/25/2023 19:32	212291
Selenium	NELAP	0.0010		**0.0162**	mg/L	5	09/25/2023 19:32	212291
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/25/2023 19:32	212291
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	09/23/2023 5:35	212305
Arsenic	NELAP	0.0010		**0.0023**	mg/L	5	09/26/2023 7:06	212305
Barium	NELAP	0.0010		**0.125**	mg/L	5	09/23/2023 5:35	212305
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 7:06	212305
Boron	NELAP	0.0250		**0.239**	mg/L	5	09/29/2023 14:23	212305
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	09/23/2023 5:35	212305
Calcium	NELAP	0.125		**87.5**	mg/L	5	09/29/2023 14:23	212305
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	09/23/2023 5:35	212305
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 7:06	212305
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	09/26/2023 7:06	212305
Lithium	*	0.0030		**0.0150**	mg/L	5	10/02/2023 12:38	212305
Molybdenum	*	0.0015		**0.0173**	mg/L	5	09/26/2023 7:06	212305
Selenium	NELAP	0.0010		**0.0182**	mg/L	5	09/26/2023 7:06	212305
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	09/23/2023 5:35	212305

LCS recovered outside upper control limits for Pb. Sample results are below the reporting limit. Data is reportable per the TNI Standard.

CCV recovered outside the upper control limits for TL. Sample results are below the reporting limit. Data is reportable per the TNI standard.

SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	09/29/2023 9:48	212516
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	10/23/2023 14:46	R338467
Radium-228	*	0		**See Attached**	pci/L	1	10/23/2023 14:46	R338467

Client: ERM
Client Project: 0599247

Work Order: 23091500
Report Date: 30-Oct-23

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
23091500-001	APW-03-WG-20230919	Groundwater	4	09/19/2023 11:35
23091500-002	APW-08-WG-20230919	Groundwater	4	09/19/2023 12:55
23091500-003	APW-07-WG-20230919	Groundwater	4	09/19/2023 13:50
23091500-004	APW-10S-WG-20230919	Groundwater	4	09/19/2023 14:50
23091500-005	APW-10D-WG-20230919	Groundwater	4	09/19/2023 16:00
23091500-006	APW-06S-WG-20230920	Groundwater	4	09/20/2023 8:50
23091500-007	APW-06D-WG-20230920	Groundwater	4	09/20/2023 10:05
23091500-008	APW-05R-WG-20230920	Groundwater	4	09/20/2023 11:25
23091500-009	APW-09-WG-20230920	Groundwater	4	09/20/2023 14:00
23091500-010	APW-02-WG-20230920	Groundwater	4	09/20/2023 12:30
23091500-011	APW-01R-WG-20230920	Groundwater	4	09/20/2023 15:10
23091500-012	APW-04-WG-20230920	Groundwater	4	09/20/2023 16:10
23091500-013	EB-01-WQ-20230919	Groundwater	4	09/19/2023 8:40
23091500-014	DUP-01-WG-20230920	Groundwater	4	09/20/2023 0:01
23091500-015	DUP-02-WG-20230920	Groundwater	4	09/20/2023 0:02

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-001A	APW-03-WG-20230919	09/19/2023 11:35	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/21/2023 15:53
	SW-846 9036 (Total)				09/22/2023 17:36
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:06
	SW-846 9214 (Total)				09/26/2023 11:11
	SW-846 9251 (Total)				09/22/2023 17:30
23091500-001B	APW-03-WG-20230919	09/19/2023 11:35	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-001C	APW-03-WG-20230919	09/19/2023 11:35	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/25/2023 23:39
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 23:46
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 18:12
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:48
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:11
23091500-001D	APW-03-WG-20230919	09/19/2023 11:35	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 18:04
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 14:29
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 13:29
23091500-002A	APW-08-WG-20230919	09/19/2023 12:55	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/21/2023 15:54
	SW-846 9036 (Total)				09/22/2023 17:54
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:07
	SW-846 9214 (Total)				09/26/2023 11:13
	SW-846 9251 (Total)				09/22/2023 17:54
23091500-002B	APW-08-WG-20230919	09/19/2023 12:55	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-002C	APW-08-WG-20230919	09/19/2023 12:55	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/25/2023 23:28
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 23:29
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 17:49
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 9:13
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:13
23091500-002D	APW-08-WG-20230919	09/19/2023 12:55	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 18:23
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 16:11
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 14:13

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-003A	APW-07-WG-20230919	09/19/2023 13:50	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/21/2023 15:54
	SW-846 9036 (Total)				09/22/2023 18:02
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:09
	SW-846 9214 (Total)				09/26/2023 11:15
	SW-846 9251 (Total)				09/22/2023 18:02
23091500-003B	APW-07-WG-20230919	09/19/2023 13:50	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-003C	APW-07-WG-20230919	09/19/2023 13:50	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/25/2023 23:34
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 23:35
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 17:55
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 9:18
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:20
23091500-003D	APW-07-WG-20230919	09/19/2023 13:50	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 18:10
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 14:35
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 13:35
23091500-004A	APW-10S-WG-20230919	09/19/2023 14:50	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/21/2023 16:05
	SW-846 9036 (Total)				09/22/2023 18:13
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:12
	SW-846 9214 (Total)				09/26/2023 11:16
	SW-846 9251 (Total)				09/22/2023 18:13
23091500-004B	APW-10S-WG-20230919	09/19/2023 14:50	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/23/2023 14:46
23091500-004C	APW-10S-WG-20230919	09/19/2023 14:50	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:19
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 23:40
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 18:01
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 9:22
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:22
23091500-004D	APW-10S-WG-20230919	09/19/2023 14:50	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 18:16
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 15:26
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 13:42

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-005A	APW-10D-WG-20230919	09/19/2023 16:00	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/21/2023 16:05
	SW-846 9036 (Total)				09/22/2023 18:48
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:13
	SW-846 9214 (Total)				09/26/2023 11:18
	SW-846 9251 (Total)				09/22/2023 18:47
23091500-005B	APW-10D-WG-20230919	09/19/2023 16:00	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-005C	APW-10D-WG-20230919	09/19/2023 16:00	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:25
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 0:31
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 18:06
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 9:26
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:24
23091500-005D	APW-10D-WG-20230919	09/19/2023 16:00	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 20:48
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 15:33
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 13:48
23091500-006A	APW-06S-WG-20230920	09/20/2023 8:50	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 10:42
	SW-846 9036 (Total)				09/22/2023 19:00
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:47
	SW-846 9214 (Total)				09/26/2023 11:20
	SW-846 9251 (Total)				09/22/2023 18:55
23091500-006B	APW-06S-WG-20230920	09/20/2023 8:50	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/23/2023 14:46
23091500-006C	APW-06S-WG-20230920	09/20/2023 8:50	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:30
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 0:37
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 18:56
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:19
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:26
23091500-006D	APW-06S-WG-20230920	09/20/2023 8:50	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 20:54
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 15:39
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 13:54

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-007A	APW-06D-WG-20230920	09/20/2023 10:05	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 10:42
	SW-846 9036 (Total)				09/22/2023 19:08
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:50
	SW-846 9214 (Total)				09/26/2023 11:22
	SW-846 9251 (Total)				09/22/2023 19:03
23091500-007B	APW-06D-WG-20230920	09/20/2023 10:05	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-007C	APW-06D-WG-20230920	09/20/2023 10:05	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:36
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 0:42
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:02
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:23
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:29
23091500-007D	APW-06D-WG-20230920	09/20/2023 10:05	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 21:00
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 15:45
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 14:01
23091500-008A	APW-05R-WG-20230920	09/20/2023 11:25	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 10:42
	SW-846 9036 (Total)				09/22/2023 19:17
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:52
	SW-846 9214 (Total)				09/26/2023 11:31
	SW-846 9251 (Total)				09/22/2023 19:11
23091500-008B	APW-05R-WG-20230920	09/20/2023 11:25	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-008C	APW-05R-WG-20230920	09/20/2023 11:25	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:41
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 0:48
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:08
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:27
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:31
23091500-008D	APW-05R-WG-20230920	09/20/2023 11:25	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 21:07
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 15:52
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 14:07

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-009A	APW-09-WG-20230920	09/20/2023 14:00	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 11:08
	SW-846 9036 (Total)				09/22/2023 19:20
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:56
	SW-846 9214 (Total)				09/26/2023 11:33
	SW-846 9251 (Total)				09/22/2023 19:19
23091500-009B	APW-09-WG-20230920	09/20/2023 14:00	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-009C	APW-09-WG-20230920	09/20/2023 14:00	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:47
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 0:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:13
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:31
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:33
23091500-009D	APW-09-WG-20230920	09/20/2023 14:00	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 21:13
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 15:58
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 15:17
23091500-010A	APW-02-WG-20230920	09/20/2023 12:30	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 11:09
	SW-846 9036 (Total)				09/22/2023 19:49
	SW-846 9040B, Laboratory Analyzed				09/27/2023 14:58
	SW-846 9214 (Total)				09/26/2023 11:35
	SW-846 9251 (Total)				09/22/2023 19:43
23091500-010B	APW-02-WG-20230920	09/20/2023 12:30	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-010C	APW-02-WG-20230920	09/20/2023 12:30	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 0:59
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:19
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:35
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:35
23091500-010D	APW-02-WG-20230920	09/20/2023 12:30	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 21:19
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 16:04
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 15:23

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-011A	APW-01R-WG-20230920	09/20/2023 15:10	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 11:09
	SW-846 9036 (Total)				09/29/2023 16:21
	SW-846 9040B, Laboratory Analyzed				09/28/2023 9:40
	SW-846 9214 (Total)				09/26/2023 11:36
	SW-846 9251 (Total)				09/22/2023 19:51
23091500-011B	APW-01R-WG-20230920	09/20/2023 15:10	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-011C	APW-01R-WG-20230920	09/20/2023 15:10	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 0:58
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 1:10
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:35
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 11:29
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:38
23091500-011D	APW-01R-WG-20230920	09/20/2023 15:10	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 21:25
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 17:14
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 15:30
23091500-012A	APW-04-WG-20230920	09/20/2023 16:10	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 11:10
	SW-846 9036 (Total)				09/27/2023 13:00
	SW-846 9040B, Laboratory Analyzed				09/28/2023 9:43
	SW-846 9214 (Total)				09/26/2023 11:38
	SW-846 9251 (Total)				09/22/2023 20:02
23091500-012B	APW-04-WG-20230920	09/20/2023 16:10	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-012C	APW-04-WG-20230920	09/20/2023 16:10	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 1:55
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 1:04
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:24
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:39
	SW-846 7470A (Total)			09/26/2023 8:27	09/26/2023 15:40
23091500-012D	APW-04-WG-20230920	09/20/2023 16:10	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 20:04
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 17:46
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 15:49

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23091500-013A	EB-01-WQ-20230919	09/19/2023 8:40	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/21/2023 16:06
	SW-846 9036 (Total)				09/22/2023 20:36
	SW-846 9040B, Laboratory Analyzed				09/27/2023 15:03
	SW-846 9214 (Total)				09/26/2023 11:40
	SW-846 9251 (Total)				09/22/2023 20:37
23091500-013B	EB-01-WQ-20230919	09/19/2023 8:40	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-013C	EB-01-WQ-20230919	09/19/2023 8:40	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/26/2023 2:00
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 2:12
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/27/2023 19:30
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:37	09/28/2023 10:44
	SW-846 7470A (Total)			09/26/2023 8:27	09/27/2023 9:48
23091500-013D	EB-01-WQ-20230919	09/19/2023 8:40	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 19:19
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 17:21
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 15:36
23091500-014A	DUP-01-WG-20230920	09/20/2023 0:01	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 11:10
	SW-846 9036 (Total)				09/22/2023 20:50
	SW-846 9040B, Laboratory Analyzed				09/27/2023 15:00
	SW-846 9214 (Total)				09/26/2023 11:43
	SW-846 9251 (Total)				09/22/2023 20:45
23091500-014B	DUP-01-WG-20230920	09/20/2023 0:01	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/13/2023 14:22
23091500-014C	DUP-01-WG-20230920	09/20/2023 0:01	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/23/2023 5:57
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/26/2023 7:25
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/28/2023 1:32
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/29/2023 14:42
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	10/02/2023 12:45
	SW-846 7470A (Total)			09/26/2023 8:27	09/27/2023 9:50
23091500-014D	DUP-01-WG-20230920	09/20/2023 0:01	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 19:26
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 17:27
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 15:42

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
23091500-015A	DUP-02-WG-20230920	09/20/2023 0:02	09/21/2023 9:45		
	Standard Methods 2540 C (Total) 1997, 2011				09/22/2023 11:31
	SW-846 9036 (Total)				09/22/2023 20:53
	SW-846 9040B, Laboratory Analyzed				09/27/2023 15:05
	SW-846 9214 (Total)				09/26/2023 11:46
	SW-846 9251 (Total)				09/22/2023 20:53
23091500-015B	DUP-02-WG-20230920	09/20/2023 0:02	09/21/2023 9:45		
	EPA 903.0/904.0, Radium 226/228				10/23/2023 14:46
23091500-015C	DUP-02-WG-20230920	09/20/2023 0:02	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/23/2023 5:35
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/26/2023 7:06
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/28/2023 1:26
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	09/29/2023 14:23
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			09/21/2023 18:38	10/02/2023 12:38
	SW-846 7470A (Total)			09/27/2023 11:50	09/29/2023 9:48
23091500-015D	DUP-02-WG-20230920	09/20/2023 0:02	09/21/2023 9:45		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/25/2023 19:32
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	09/29/2023 17:33
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			09/21/2023 14:04	10/02/2023 16:33

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

STANDARD METHODS 2540 C (TOTAL) 1997, 2011

Batch R336743 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	09/21/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	09/21/2023

Batch R336743 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**940**	1000	0	94.0	90	110	09/21/2023
Total Dissolved Solids		20		**948**	1000	0	94.8	90	110	09/21/2023

Batch R336743 **SampType:** DUP Units **mg/L** RPD Limit **10**
SampID: 23091500-001ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		20		**660**				636.0	3.70	09/21/2023

Batch R336815 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	09/22/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	09/22/2023
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	09/22/2023

Batch R336815 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**950**	1000	0	95.0	90	110	09/22/2023
Total Dissolved Solids		20		**964**	1000	0	96.4	90	110	09/22/2023
Total Dissolved Solids		20		**962**	1000	0	96.2	90	110	09/22/2023

Batch R336815 **SampType:** DUP Units **mg/L** RPD Limit **10**
SampID: 23091500-006ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		50		**585**				565.0	3.48	09/22/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

STANDARD METHODS 2540 C (TOTAL) 1997, 2011

Batch R336815 **SampType:** DUP Units **mg/L** RPD Limit **10**

SampID: 23091500-015ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		20		**380**				386.0	1.57	09/22/2023

SW-846 9036 (TOTAL)

Batch R336796 **SampType:** MBLK Units **mg/L**

SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	09/22/2023

Batch R336796 **SampType:** MBLK Units **mg/L**

SampID: MB-R336796

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	09/22/2023

Batch R336796 **SampType:** LCS Units **mg/L**

SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**18**	20.00	0	90.1	90	110	09/22/2023

Batch R336796 **SampType:** LCS Units **mg/L**

SampID: LCS-R336796

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**18**	20.00	0	90.1	90	110	09/22/2023

Batch R336796 **SampType:** MS Units **mg/L**

SampID: 23091500-004AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10	S	**12**	20.00	0	60.6	85	115	09/22/2023

Batch R336796 **SampType:** MSD Units **mg/L** RPD Limit **10**

SampID: 23091500-004AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		10	S	**13**	20.00	0	63.8	12.11	5.15	09/22/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9036 (TOTAL)

Batch R336910 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	09/26/2023

Batch R336910 **SampType:** MBLK Units **mg/L**
SampID: MB-R336910

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	7.620	0	0	-100	100	09/26/2023

Batch R336910 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**18**	20.00	0	90.5	90	110	09/26/2023

Batch R336910 **SampType:** LCS Units **mg/L**
SampID: LCS-R336910

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**18**	20.00	0	90.5	90	110	09/26/2023

Batch R337008 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	09/27/2023

Batch R337008 **SampType:** MBLK Units **mg/L**
SampID: MB-R337008

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	09/27/2023

Batch R337008 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	93.6	90	110	09/27/2023

Batch R337008 **SampType:** LCS Units **mg/L**
SampID: LCS-R337008

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	93.6	90	110	09/27/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9036 (TOTAL)

Batch R337008 **SampType:** MS Units **mg/L**
SampID: 23091500-012AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		20	E	**103**	40.00	66.47	92.1	85	115	09/27/2023

Batch R337008 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 23091500-012AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		20	E	**105**	40.00	66.47	96.3	103.3	1.63	09/27/2023

Batch R337145 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.280	0	100.0	-100	100	09/29/2023

Batch R337145 **SampType:** MBLK Units **mg/L**
SampID: MB-R337145

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.280	0	100.0	-100	100	09/29/2023

Batch R337145 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	92.8	90	110	09/29/2023

Batch R337145 **SampType:** LCS Units **mg/L**
SampID: LCS-R337145

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	92.8	90	110	09/29/2023

SW-846 9040B, LABORATORY ANALYZED

Batch R336927 **SampType:** LCS Units
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		**6.99**	7.000	0	99.9	99.29	100.7	09/27/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9040B, LABORATORY ANALYZED

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-001ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.84**				7.840	0.00	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-002ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.17**				7.160	0.14	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-003ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.95**				6.940	0.14	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-004ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.18**				7.170	0.14	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-005ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.21**				7.220	0.14	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-006ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.23**				7.210	0.28	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-007ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.30**				7.300	0.00	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-008ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.36**				7.360	0.00	09/27/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9040B, LABORATORY ANALYZED

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-009ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.55**				7.560	0.13	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-010ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.16**				7.150	0.14	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-013ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**5.48**				5.500	0.36	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-014ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.36**				7.360	0.00	09/27/2023

Batch R336927 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-015ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.67**				7.650	0.26	09/27/2023

Batch R336991 **SampType:** LCS Units

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		**6.99**	7.000	0	99.9	99.29	100.7	09/28/2023

Batch R336991 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-011ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.68**				6.660	0.30	09/28/2023

Batch R336991 **SampType:** DUP Units RPD Limit **10**

SampID: 23091500-012ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.59**				7.560	0.40	09/28/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9214 (TOTAL)

Batch R336875 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**< 0.10**	0.0500	0	0	-100	100	09/26/2023

Batch R336875 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**1.03**	1.000	0	103.3	90	110	09/26/2023

Batch R336875 **SampType:** MS Units **mg/L**
SampID: 23091500-007AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.25**	2.000	0.2180	101.5	75	125	09/26/2023

Batch R336875 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23091500-007AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.23**	2.000	0.2180	100.7	2.247	0.67	09/26/2023

Batch R336875 **SampType:** MS Units **mg/L**
SampID: 23091500-015AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.36**	2.000	0.1890	108.4	75	125	09/26/2023

Batch R336875 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23091500-015AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.24**	2.000	0.1890	102.6	2.358	5.09	09/26/2023

SW-846 9251 (TOTAL)

Batch R336801 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	09/22/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9251 (TOTAL)

Batch R336801 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**19**	20.00	0	93.4	90	110	09/22/2023

Batch R336801 **SampType:** MS Units **mg/L**
SampID: 23091500-004AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**33**	20.00	14.98	87.7	85	115	09/22/2023

Batch R336801 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23091500-004AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		4		**33**	20.00	14.98	89.0	32.52	0.80	09/22/2023

Batch R336801 **SampType:** MS Units **mg/L**
SampID: 23091500-012AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**27**	20.00	9.220	90.3	85	115	09/22/2023

Batch R336801 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23091500-012AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		4		**28**	20.00	9.220	94.3	27.28	2.89	09/22/2023

Batch R336945 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	09/26/2023

Batch R336945 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**21**	20.00	0	105.2	90	110	09/26/2023

Batch R337023 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	09/27/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 9251 (TOTAL)

Batch R337023 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**20**	20.00	0	99.6	90	110	09/27/2023

Batch R337157 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	09/29/2023

Batch R337157 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**20**	20.00	0	100.0	90	110	09/29/2023

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 212291 **SampType:** MBLK Units **mg/L**
SampID: MBLK-212291

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	09/25/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	09/25/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	09/25/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	09/25/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	09/25/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	09/25/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	09/25/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	09/25/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	09/25/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	09/25/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	09/25/2023
Molybdenum	*	0.0015		**< 0.0015**	0.0006	0	0	-100	100	09/25/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	09/25/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	09/25/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 212291 **SampType:** LCS Units **mg/L**

SampID: LCS-212291

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.492**	0.5000	0	98.5	80	120	09/25/2023
Arsenic		0.0010		**0.477**	0.5000	0	95.4	80	120	09/25/2023
Barium		0.0010		**2.00**	2.000	0	100.2	80	120	09/25/2023
Beryllium		0.0010		**0.0476**	0.0500	0	95.3	80	120	10/02/2023
Boron		0.0250		**0.502**	0.5000	0	100.5	80	120	09/25/2023
Cadmium		0.0010		**0.0487**	0.0500	0	97.3	80	120	09/25/2023
Calcium		0.125		**2.47**	2.500	0	99.0	80	120	09/29/2023
Chromium		0.0015		**0.199**	0.2000	0	99.6	80	120	09/25/2023
Cobalt		0.0010		**0.510**	0.5000	0	102.0	80	120	09/25/2023
Lead		0.0010		**0.520**	0.5000	0	104.0	80	120	09/25/2023
Lithium	*	0.0030		**0.497**	0.5000	0	99.4	80	120	10/02/2023
Molybdenum	*	0.0015		**0.476**	0.5000	0	95.1	80	120	09/25/2023
Selenium		0.0010		**0.434**	0.5000	0	86.9	80	120	09/25/2023
Thallium		0.0020		**0.245**	0.2500	0	98.0	80	120	09/25/2023

Batch 212291 **SampType:** MS Units **mg/L**

SampID: 23091500-002DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.508**	0.5000	0	101.6	75	125	09/25/2023
Arsenic		0.0010		**0.518**	0.5000	0.001392	103.2	75	125	09/25/2023
Barium		0.0010		**2.28**	2.000	0.2358	102.1	75	125	10/02/2023
Beryllium		0.0010		**0.0516**	0.0500	0	103.2	75	125	10/02/2023
Boron		0.0250		**0.629**	0.5000	0.1174	102.3	75	125	09/25/2023
Cadmium		0.0010		**0.0503**	0.0500	0	100.5	75	125	09/25/2023
Calcium		0.125	S	**95.9**	2.500	94.13	70.4	75	125	09/29/2023
Chromium		0.0015		**0.205**	0.2000	0	102.6	75	125	09/25/2023
Cobalt		0.0010		**0.509**	0.5000	0.0007075	101.6	75	125	09/25/2023
Lead		0.0010		**0.524**	0.5000	0	104.8	75	125	09/25/2023
Lithium	*	0.0030		**0.539**	0.5000	0.02205	103.4	75	125	10/02/2023
Molybdenum	*	0.0015		**0.500**	0.5000	0	100.0	75	125	09/25/2023
Selenium		0.0010		**0.476**	0.5000	0.01213	92.9	75	125	09/25/2023
Thallium		0.0020		**0.251**	0.2500	0	100.5	75	125	09/29/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 212291 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23091500-002DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.440**	0.5000	0	88.0	0.5079	14.32	09/25/2023
Arsenic		0.0010		**0.472**	0.5000	0.001392	94.2	0.5175	9.14	09/25/2023
Barium		0.0010		**2.25**	2.000	0.2358	100.8	2.277	1.12	10/02/2023
Beryllium		0.0010		**0.0514**	0.0500	0	102.8	0.05159	0.34	10/02/2023
Boron		0.0250		**0.592**	0.5000	0.1174	95.0	0.6287	5.95	09/25/2023
Cadmium		0.0010		**0.0433**	0.0500	0	86.6	0.05025	14.83	09/25/2023
Calcium		0.125	S	**90.6**	2.500	94.13	-140.5	95.89	5.65	09/29/2023
Chromium		0.0015		**0.169**	0.2000	0	84.3	0.2052	19.61	09/25/2023
Cobalt		0.0010		**0.422**	0.5000	0.0007075	84.2	0.5086	18.70	09/25/2023
Lead		0.0010		**0.446**	0.5000	0	89.3	0.5242	16.01	09/25/2023
Lithium	*	0.0030		**0.533**	0.5000	0.02205	102.3	0.5392	1.10	10/02/2023
Molybdenum	*	0.0015		**0.437**	0.5000	0	87.5	0.4998	13.32	09/25/2023
Selenium		0.0010		**0.454**	0.5000	0.01213	88.4	0.4765	4.82	09/25/2023
Thallium		0.0020		**0.213**	0.2500	0	85.2	0.2513	16.50	09/29/2023

Batch 212291 **SampType:** MS Units **mg/L**

SampID: 23091500-012DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.495**	0.5000	0	99.0	75	125	09/25/2023
Arsenic		0.0010		**0.489**	0.5000	0.001563	97.5	75	125	09/25/2023
Barium		0.0010		**2.14**	2.000	0.1383	100.3	75	125	09/25/2023
Beryllium		0.0010		**0.0500**	0.0500	0	100.0	75	125	10/02/2023
Boron		0.0250		**1.06**	0.5000	0.5910	93.8	75	125	09/25/2023
Cadmium		0.0010		**0.0494**	0.0500	0	98.8	75	125	09/25/2023
Calcium		0.125	S	**105**	2.500	101.4	148.5	75	125	09/29/2023
Chromium		0.0015		**0.195**	0.2000	0	97.3	75	125	09/25/2023
Cobalt		0.0010		**0.494**	0.5000	0.0001230	98.7	75	125	09/25/2023
Lead		0.0010		**0.511**	0.5000	0	102.2	75	125	09/25/2023
Lithium	*	0.0030		**0.544**	0.5000	0.04106	100.6	75	125	10/02/2023
Molybdenum	*	0.0015		**0.520**	0.5000	0.03666	96.6	75	125	09/25/2023
Selenium		0.0010		**0.452**	0.5000	0.009604	88.5	75	125	09/25/2023
Thallium		0.0020		**0.255**	0.2500	0	101.9	75	125	09/25/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 212291 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23091500-012DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.506**	0.5000	0	101.2	0.4952	2.19	09/25/2023
Arsenic		0.0010		**0.480**	0.5000	0.001563	95.7	0.4892	1.89	09/25/2023
Barium		0.0010		**2.21**	2.000	0.1383	103.4	2.144	2.88	09/25/2023
Beryllium		0.0010		**0.0477**	0.0500	0	95.3	0.04999	4.77	10/02/2023
Boron		0.0250		**1.09**	0.5000	0.5910	100.7	1.060	3.18	09/25/2023
Cadmium		0.0010		**0.0496**	0.0500	0	99.2	0.04938	0.40	09/25/2023
Calcium		0.125	S	**102**	2.500	101.4	38.9	105.1	2.64	09/29/2023
Chromium		0.0015		**0.195**	0.2000	0	97.7	0.1945	0.47	09/25/2023
Cobalt		0.0010		**0.497**	0.5000	0.0001230	99.3	0.4936	0.66	09/25/2023
Lead		0.0010		**0.515**	0.5000	0	103.0	0.5111	0.76	09/25/2023
Lithium	*	0.0030		**0.534**	0.5000	0.04106	98.7	0.5440	1.79	10/02/2023
Molybdenum	*	0.0015		**0.524**	0.5000	0.03666	97.4	0.5198	0.77	09/25/2023
Selenium		0.0010		**0.445**	0.5000	0.009604	87.2	0.4519	1.44	09/25/2023
Thallium		0.0020		**0.257**	0.2500	0	102.8	0.2547	0.93	09/25/2023

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 212304 **SampType:** MBLK Units **mg/L**

SampID: MBLK-212304

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	09/26/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	09/26/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	09/26/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	09/26/2023
Boron	*	0.0250		**< 0.0250**	0.0093	0	0	-100	100	09/28/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	09/26/2023
Calcium	*	0.125		**< 0.125**	0.0700	0	0	-100	100	09/26/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	09/26/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	09/26/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	09/26/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	09/26/2023
Molybdenum	*	0.0015		**< 0.0015**	0.0006	0	0	-100	100	09/26/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	09/26/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	09/26/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 212304 **SampType:** LCS Units **mg/L**

SampID: LCS-212304

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.504**	0.5000	0	100.9	85	115	09/26/2023
Arsenic		0.0010		**0.517**	0.5000	0	103.5	85	115	09/26/2023
Barium		0.0010		**1.99**	2.000	0	99.4	85	115	09/26/2023
Beryllium		0.0010		**0.0509**	0.0500	0	101.9	85	115	09/26/2023
Boron	*	0.0250		**0.509**	0.5000	0	101.8	85	115	09/28/2023
Cadmium		0.0010		**0.0508**	0.0500	0	101.7	85	115	09/26/2023
Calcium	*	0.125		**2.32**	2.500	0	92.7	85	115	09/26/2023
Chromium		0.0015		**0.207**	0.2000	0	103.7	85	115	09/26/2023
Cobalt		0.0010		**0.535**	0.5000	0	106.9	85	115	09/26/2023
Lead		0.0010		**0.516**	0.5000	0	103.2	85	115	09/26/2023
Lithium	*	0.0030		**0.487**	0.5000	0	97.5	85	115	09/28/2023
Lithium	*	0.0030		**0.532**	0.5000	0	106.3	85	115	09/26/2023
Molybdenum	*	0.0015		**0.505**	0.5000	0	101.0	85	115	09/26/2023
Selenium		0.0010		**0.454**	0.5000	0	90.8	85	115	09/26/2023
Thallium		0.0020		**0.255**	0.2500	0	101.9	85	115	09/26/2023

Batch 212304 **SampType:** MS Units **mg/L**

SampID: 23091500-001CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.501**	0.5000	0	100.2	75	125	09/26/2023
Arsenic		0.0010		**0.520**	0.5000	0.001745	103.6	75	125	09/26/2023
Barium		0.0010		**2.16**	2.000	0.1367	100.9	75	125	09/26/2023
Beryllium		0.0010		**0.0498**	0.0500	0	99.5	75	125	09/26/2023
Boron		0.0250		**4.70**	0.5000	4.185	102.8	75	125	09/28/2023
Cadmium		0.0010		**0.0494**	0.0500	0	98.7	75	125	09/26/2023
Calcium		0.125	S	**124**	2.500	124.1	1.5	75	125	09/26/2023
Chromium		0.0015		**0.199**	0.2000	0.0008581	99.1	75	125	09/26/2023
Cobalt		0.0010		**0.509**	0.5000	0	101.7	75	125	09/26/2023
Lead		0.0010		**0.521**	0.5000	0	104.3	75	125	09/26/2023
Lithium	*	0.0030		**0.534**	0.5000	0.03125	100.6	75	125	09/26/2023
Molybdenum	*	0.0015		**0.552**	0.5000	0.05583	99.2	75	125	09/26/2023
Selenium		0.0010		**0.462**	0.5000	0	92.4	75	125	09/26/2023
Thallium		0.0020		**0.255**	0.2500	0	101.8	75	125	09/26/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 212304 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23091500-001CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.501**	0.5000	0	100.2	0.5011	0.01	09/26/2023
Arsenic		0.0010		**0.525**	0.5000	0.001745	104.7	0.5198	1.09	09/26/2023
Barium		0.0010		**2.16**	2.000	0.1367	100.9	2.156	0.01	09/26/2023
Beryllium		0.0010		**0.0500**	0.0500	0	100.0	0.04977	0.49	09/26/2023
Boron		0.0250	S	**4.86**	0.5000	4.185	135.0	4.699	3.37	09/28/2023
Cadmium		0.0010		**0.0492**	0.0500	0	98.5	0.04937	0.25	09/26/2023
Calcium		0.125	S	**128**	2.500	124.1	158.0	124.1	3.10	09/26/2023
Chromium		0.0015		**0.195**	0.2000	0.0008581	97.0	0.1990	2.13	09/26/2023
Cobalt		0.0010		**0.492**	0.5000	0	98.5	0.5087	3.25	09/26/2023
Lead		0.0010		**0.514**	0.5000	0	102.7	0.5213	1.49	09/26/2023
Lithium	*	0.0030		**0.543**	0.5000	0.03125	102.4	0.5344	1.67	09/26/2023
Molybdenum	*	0.0015		**0.540**	0.5000	0.05583	96.8	0.5520	2.26	09/26/2023
Selenium		0.0010		**0.468**	0.5000	0	93.6	0.4621	1.31	09/26/2023
Thallium		0.0020		**0.241**	0.2500	0	96.3	0.2546	5.56	09/26/2023

Batch 212304 **SampType:** MS Units **mg/L**

SampID: 23091500-011CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.483**	0.5000	0	96.7	75	125	09/27/2023
Arsenic		0.0010		**0.497**	0.5000	0.002886	98.9	75	125	09/27/2023
Barium		0.0010		**2.26**	2.000	0.2016	102.9	75	125	09/27/2023
Beryllium		0.0010		**0.0522**	0.0500	0	104.5	75	125	09/27/2023
Boron		0.0250		**0.699**	0.5000	0.1801	103.8	75	125	09/28/2023
Cadmium		0.0010		**0.0497**	0.0500	0	99.5	75	125	09/27/2023
Calcium		0.125	S	**70.6**	2.500	59.21	454.3	75	125	09/27/2023
Chromium		0.0015		**0.214**	0.2000	0.008548	102.6	75	125	09/27/2023
Cobalt		0.0010		**0.504**	0.5000	0.004115	100.0	75	125	09/27/2023
Lead		0.0010		**0.504**	0.5000	0.002599	100.4	75	125	09/27/2023
Lithium	*	0.0030		**0.498**	0.5000	0.01467	96.6	75	125	09/28/2023
Molybdenum	*	0.0015		**0.482**	0.5000	0.0007717	96.2	75	125	09/27/2023
Selenium		0.0010		**0.465**	0.5000	0.003654	92.3	75	125	09/27/2023
Thallium		0.0020		**0.251**	0.2500	0	100.5	75	125	09/27/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 212304 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23091500-011CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.487**	0.5000	0	97.4	0.4834	0.75	09/27/2023
Arsenic		0.0010		**0.521**	0.5000	0.002886	103.7	0.4975	4.70	09/27/2023
Barium		0.0010		**2.25**	2.000	0.2016	102.5	2.259	0.29	09/27/2023
Beryllium		0.0010		**0.0524**	0.0500	0	104.9	0.05225	0.38	09/27/2023
Boron		0.0250		**0.748**	0.5000	0.1801	113.6	0.6993	6.77	09/28/2023
Cadmium		0.0010		**0.0514**	0.0500	0	102.8	0.04975	3.26	09/27/2023
Calcium		0.125	S	**70.9**	2.500	59.21	465.9	70.57	0.41	09/27/2023
Chromium		0.0015		**0.207**	0.2000	0.008548	99.4	0.2137	2.99	09/27/2023
Cobalt		0.0010		**0.499**	0.5000	0.004115	98.9	0.5040	1.04	09/27/2023
Lead		0.0010		**0.513**	0.5000	0.002599	102.1	0.5045	1.72	09/27/2023
Lithium	*	0.0030		**0.525**	0.5000	0.01467	102.0	0.4978	5.24	09/28/2023
Molybdenum	*	0.0015		**0.495**	0.5000	0.0007717	98.8	0.4816	2.65	09/27/2023
Selenium		0.0010		**0.486**	0.5000	0.003654	96.5	0.4650	4.44	09/27/2023
Thallium		0.0020		**0.246**	0.2500	0	98.5	0.2512	2.02	09/27/2023

Batch 212305 **SampType:** MBLK Units **mg/L**

SampID: MBLK-212305

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	09/23/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	09/26/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	09/23/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	09/26/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	09/29/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	09/23/2023
Calcium	*	0.125		**< 0.125**	0.0700	0	0	-100	100	09/23/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	09/23/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	09/26/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	09/26/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	09/29/2023
Molybdenum	*	0.0015		**< 0.0015**	0.0006	0	0	-100	100	09/26/2023
Molybdenum	*	0.0015		**< 0.0015**	0.0006	0	0	-100	100	09/23/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	09/26/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	09/23/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 212305 **SampType:** LCS Units **mg/L**

SampID: LCS-212305

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.475**	0.5000	0	95.0	85	115	09/23/2023
Arsenic		0.0010		**0.560**	0.5000	0	111.9	85	115	09/26/2023
Barium		0.0010		**1.96**	2.000	0	97.9	85	115	09/23/2023
Beryllium		0.0010		**0.0529**	0.0500	0	105.8	85	115	09/26/2023
Boron		0.0250		**0.535**	0.5000	0	107.1	80	120	09/29/2023
Cadmium		0.0010		**0.0475**	0.0500	0	94.9	85	115	09/23/2023
Calcium		0.125		**2.63**	2.500	0	105.3	80	120	09/29/2023
Chromium		0.0015		**0.188**	0.2000	0	94.0	85	115	09/23/2023
Cobalt		0.0010		**0.564**	0.5000	0	112.9	85	115	09/26/2023
Lead		0.0010		**0.516**	0.5000	0	103.2	80	120	09/28/2023
Lead		0.0010	SE	**0.591**	0.5000	0	118.2	85	115	09/26/2023
Lithium	*	0.0030		**0.541**	0.5000	0	108.1	80	120	10/02/2023
Molybdenum	*	0.0015		**0.475**	0.5000	0	94.9	85	115	09/23/2023
Molybdenum	*	0.0015		**0.542**	0.5000	0	108.4	85	115	09/26/2023
Selenium		0.0010		**0.509**	0.5000	0	101.8	85	115	09/26/2023
Thallium		0.0020		**0.244**	0.2500	0	97.6	85	115	09/23/2023

Batch 212305 **SampType:** MS Units **mg/L**

SampID: 23091500-014CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.479**	0.5000	0	95.9	75	125	09/23/2023
Arsenic		0.0010		**0.556**	0.5000	0.002554	110.7	75	125	09/26/2023
Barium		0.0010		**2.17**	2.000	0.1579	100.4	75	125	09/23/2023
Beryllium		0.0010		**0.0548**	0.0500	0	109.6	75	125	09/26/2023
Boron		0.0250	S	**9.34**	0.5000	8.327	202.8	75	125	09/29/2023
Cadmium		0.0010		**0.0477**	0.0500	0	95.4	75	125	09/23/2023
Calcium		0.125	S	**132**	2.500	125.9	241.4	75	125	09/29/2023
Chromium		0.0015		**0.211**	0.2000	0.001567	104.7	75	125	10/02/2023
Cobalt		0.0010		**0.567**	0.5000	0.0003208	113.4	75	125	09/26/2023
Lead		0.0010		**0.528**	0.5000	0.002105	105.2	75	125	09/28/2023
Lithium	*	0.0030		**0.585**	0.5000	0.04248	108.5	75	125	10/02/2023
Molybdenum	*	0.0015		**0.793**	0.5000	0.2350	111.7	75	125	09/26/2023
Selenium		0.0010		**0.499**	0.5000	0	99.8	75	125	09/26/2023
Thallium		0.0020		**0.247**	0.2500	0	98.9	75	125	09/23/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 212305 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23091500-014CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.500**	0.5000	0	100.0	0.4795	4.23	09/23/2023
Arsenic		0.0010		**0.541**	0.5000	0.002554	107.7	0.5563	2.73	09/26/2023
Barium		0.0010		**2.16**	2.000	0.1579	99.9	2.166	0.46	09/23/2023
Beryllium		0.0010		**0.0561**	0.0500	0	112.2	0.05478	2.35	09/26/2023
Boron		0.0250	S	**9.13**	0.5000	8.327	160.2	9.342	2.31	09/29/2023
Cadmium		0.0010		**0.0490**	0.0500	0	98.0	0.04770	2.71	09/23/2023
Calcium		0.125		**129**	2.500	125.9	122.9	131.9	2.27	09/29/2023
Chromium		0.0015		**0.208**	0.2000	0.001567	103.2	0.2110	1.39	10/02/2023
Cobalt		0.0010		**0.535**	0.5000	0.0003208	107.0	0.5673	5.78	09/26/2023
Lead		0.0010		**0.526**	0.5000	0.002105	104.8	0.5279	0.35	09/28/2023
Lithium	*	0.0030		**0.592**	0.5000	0.04248	109.9	0.5848	1.25	10/02/2023
Molybdenum	*	0.0015		**0.787**	0.5000	0.2350	110.5	0.7932	0.76	09/26/2023
Selenium		0.0010		**0.480**	0.5000	0	96.1	0.4988	3.77	09/26/2023
Thallium		0.0020		**0.246**	0.2500	0	98.4	0.2472	0.46	09/23/2023

SW-846 7470A (TOTAL)

Batch 212412 **SampType:** MBLK Units **mg/L**

SampID: MBLK-212412

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	09/26/2023

Batch 212412 **SampType:** LCS Units **mg/L**

SampID: LCS-212412

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00505**	0.0050	0	100.9	85	115	09/26/2023

Batch 212412 **SampType:** MS Units **mg/L**

SampID: 23091500-012CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00521**	0.0050	0	104.1	75	125	09/27/2023

Batch 212412 **SampType:** MSD Units **mg/L** RPD Limit **15**

SampID: 23091500-012CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00537**	0.0050	0	107.4	0.005206	3.08	09/27/2023

Client: ERM **Work Order:** 23091500

Client Project: 0599247 **Report Date:** 30-Oct-23

SW-846 7470A (TOTAL)

Batch 212516 **SampType:** MBLK Units **mg/L**

SampID: MBLK-212516

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	09/29/2023

Batch 212516 **SampType:** LCS Units **mg/L**

SampID: LCS-212516

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00522**	0.0050	0	104.3	85	115	09/29/2023

Batch 212516 **SampType:** MS Units **mg/L**

SampID: 23091500-015CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00518**	0.0050	0	103.5	75	125	09/29/2023

Batch 212516 **SampType:** MSD Units **mg/L** RPD Limit **15**

SampID: 23091500-015CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00489**	0.0050	0	97.8	0.005176	5.69	09/29/2023

Receiving Check List

http://www.teklabinc.com/

Client: ERM
Client Project: 0599247

Work Order: 23091500
Report Date: 30-Oct-23

Carrier: Marshall Arendell

Received By: MBP

Completed by: Amber Dilallo
On: 21-Sep-23

Reviewed by: Ellie Hopkins
On: 21-Sep-23

Pages to follow: Chain of custody 2 Extra pages included 34

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C	3.4		
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐			
Chain of custody present?	Yes ☑	No ☐					
Chain of custody signed when relinquished and received?	Yes ☑	No ☐					
Chain of custody agrees with sample labels?	Yes ☑	No ☐					
Samples in proper container/bottle?	Yes ☑	No ☐					
Sample containers intact?	Yes ☑	No ☐					
Sufficient sample volume for indicated test?	Yes ☑	No ☐					
All samples received within holding time?	Yes ☐	No ☑					
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐				

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

Any No responses must be detailed below or on the COC.

pH strip #90719. - amberdilallo - 9/21/2023 12:08:50 PM

Additional Nitric Acid (92447) was needed in APW-07-WG-20230919 and APW-105-WG-20230919 upon arrival at the laboratory. - CET/amberdilallo - 9/21/2023 12:09:03 PM

EB-01-WQ-20230919 was filtered and preserved with Nitric Acid (92447) for the dissolved parameters upon arrival at the laboratory. - amberdilallo - 9/21/2023 12:10:41 PM

CHAIN OF CUSTODY

pg. 1 of 2 Work order # 23091500

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client:	ERM
Address:	1968 Craig Road
City / State / Zip	St. Louis, MO 63146
Contact:	Matt Halley
Phone:	(314) 952-2760
E-Mail:	matt.halley@erm.com
Fax:	

Samples on: [X] ICE ☐ BLUE ICE ☐ NO ICE 3.4 °C LTG# 3

Preserved in: [X] LAB ☐ FIELD **FOR LAB USE ONLY**

Lab Notes (HA07190.A2222 HNO3 (82447) to all 2 liters from APW-07 and APW-05. CTF 9-21-23.

Are these samples known to be involved in litigation? If yes, a surcharge will apply ☐ Yes ☐ No

Are these samples known to be hazardous? If yes, include details of the hazard. ☐ Yes ☐ No

Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. ☐ Yes ☐ No

Client Comments:

Total Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se Tl and Hg

Dissolved Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se and Tl

SUB Ra226/228 to Summit-OH.

Project Name/Number: 0599247

Sample Collector's Name: Clay Sansoucie / Marshall Arendell

Results Requested: [X] Standard ☐ 1-2 Day (100% Surcharge) ☐ Other ____ ☐ 3 Day (50% Surcharge)

Billing Instructions: 0599247

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	Chloride	Dissolved Metals	Fluoride	pH	Ra226/228	Sulfate	TDS	Total Metals
23091500 001	APW-03-WG-20230919	9/19/23; 1135	1	2		2										X	X	X	X	X	X	X	X	X
002	APW-08-WG-20230919	9/19/23; 1255	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
003	APW-07-WG-20230919	9/19/23; 1350	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
004	APW-109-WG-20230919	9/19/23; 1450	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
005	APW-100-WG-20230919	9/19/23; 1600	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
006	APW-065-WG-20230920	9/20/23; 0850	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
007	APW-060-WG-20230920	9/20/23; 1005	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
008	APW-05R-WG-20230920	9/20/23; 1125	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
009	APW-09-WG-20230920	9/20/23; 1400	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
010	APW-02-WG-20230920	9/20/23; 1230	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓

Relinquished By	Date/Time	Received By	Date/Time
Marshall Arendell (signature)	9/21/23 0945	(signature)	9/21/23 0945

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 82816

CTF 9-21-23

CHAIN OF CUSTODY

pg. 2 of 2 Work order # 23091500

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client:	ERM
Address:	1968 Craig Road
City / State / Zip	St. Louis, MO 63146
Contact:	Matt Halley
Phone:	(314) 952-2760
E-Mail:	matt.halley@erm.com
Fax:	

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 3.4 °C LTG# 3

Preserved in: [X] LAB [ ] FIELD

FOR LAB USE ONLY

Lab Notes

Are these samples known to be involved in litigation? If yes, a surcharge will apply [ ] Yes [ ] No

Are these samples known to be hazardous? If yes, include details of the hazard. [ ] Yes [ ] No

Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. [ ] Yes [ ] No

Client Comments:

Total Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se Tl and Hg

Dissolved Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se and Tl

SUB Ra226/228 to Summit-OH.

Project Name/Number: 0599247

Sample Collector's Name: Clay Sansoucie/Marshall Arendell

Results Requested: [X] Standard [ ] 1-2 Day (100% Surcharge) [ ] Other ____ [ ] 3 Day (50% Surcharge)

Billing Instructions: 0599247

Lab Use Only	Sample Identification	Date/Time Sampled	# and Type of Containers: UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	MATRIX: Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	INDICATE ANALYSIS REQUESTED: Chloride	Dissolved Metals	Fluoride	pH	Ra226/228	Sulfate	TDS	Total Metals
23091500 011	APW-DUP-WG-20230920	9/20/23; 1510	1	2		2										X	X	X	X	X	X	X	X	X
012	APW-04-WG-20230920	9/20/23; 1610	1	2		2																		
013	EB-01-WG-20230919	9/19/23; 0840	1	1		2																		
014	DUP-01-WG-20230920	9/20/23; 0001	1	2		2																		
015	DUP-02-WG-20230920	9/20/23; 0002	1	2		2																		

Relinquished By	Date/Time	Received By	Date/Time
Marshall Arendell	9/21/23 0945	Maureen Peter	9/21/23 0945

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 82816

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

October 30, 2023

Elizabeth Hurley
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 23091500

Order No.: 23091975

Dear Elizabeth Hurley:

Summit Environmental Technologies, Inc. received 15 sample(s) on 9/28/2023 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

If you have any questions regarding these tests results, please feel free to call the laboratory.

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

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Case Narrative

WO#: **23091975**
Date: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500

WorkOrder Narrative:
23091975: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

 The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

Analytical Sequence Sample Notes:
23091975-002A Radium-228_NPW(904.0): Sample and Sample Duplicate exhibited high RPD for Radium-228. Both samples exhibit detections < PQL.
23091975-003A Radium-228_NPW(904.0): Sample and Sample Duplicate exhibited high RPD for Radium-228. Both samples exhibit detections < PQL.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, In
3310 Win S
Cuyahoga Falls, Ohio 4422
TEL: (330) 253-8211 FAX: (330) 253-44
Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **23091975**
Date: **10/30/2023**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

Summit Environmental Technologies, Inc.
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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Workorder Sample Summary

WO#: **23091975**

30-Oct-23

CLIENT: TEKLAB Inc,
Project: 23091500

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
23091975-001	23091500-001		9/19/2023 11:35:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-002	23091500-002		9/19/2023 12:55:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-003	23091500-003		9/19/2023 1:50:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-004	23091500-004		9/19/2023 2:50:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-005	23091500-005		9/19/2023 4:00:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-006	23091500-006		9/20/2023 8:50:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-007	23091500-007		9/20/2023 10:05:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-008	23091500-008		9/20/2023 11:25:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-009	23091500-009		9/20/2023 2:00:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-010	23091500-010		9/20/2023 12:30:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-011	23091500-011		9/20/2023 3:10:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-012	23091500-012		9/20/2023 4:10:00 PM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-013	23091500-013		9/19/2023 8:40:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-014	23091500-014		9/20/2023 12:01:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water
23091975-015	23091500-015		9/20/2023 12:02:00 AM	9/28/2023 12:45:00 PM	Non-Potable Water

Summit Environmental Technologies, Inc.
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DATES REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23091975-001A	23091500-001	9/19/2023 11:35:00 AM	Non-Potable Water	Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-002A	23091500-002	9/19/2023 12:55:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-003A	23091500-003	9/19/2023 1:50:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-004A	23091500-004	9/19/2023 2:50:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/17/2023 1:42:45 PM	10/23/2023 2:46:00 PM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-005A	23091500-005	9/19/2023 4:00:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-006A	23091500-006	9/20/2023 8:50:00 AM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
				Radium-228 (EPA 904.0)		10/17/2023 1:42:45 PM	10/23/2023 2:46:00 PM
23091975-007A	23091500-007	9/20/2023 10:05:00 AM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

DATES REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23091975-008A	23091500-008	9/20/2023 11:25:00 AM	Non-Potable Water	Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-009A	23091500-009	9/20/2023 2:00:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-010A	23091500-010	9/20/2023 12:30:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-011A	23091500-011	9/20/2023 3:10:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-012A	23091500-012	9/20/2023 4:10:00 PM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-013A	23091500-013	9/19/2023 8:40:00 AM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-014A	23091500-014	9/20/2023 12:01:00 AM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM
23091975-015A	23091500-015	9/20/2023 12:02:00 AM		Combined Radium (EPA903+904)			10/27/2023 8:17:34 AM
				Radium-226 (EPA 903.0)		10/3/2023 12:20:13 PM	10/16/2023 10:09:00 AM

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

DATES REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,

Project: 23091500

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23091975-015A	23091500-015	9/20/2023 12:02:00 AM	Non-Potable Water	Radium-228 (EPA 904.0)		10/17/2023 1:42:45 PM	10/23/2023 2:46:00 PM
				Radium-228 (EPA 904.0)		10/3/2023 12:20:13 PM	10/13/2023 2:22:00 PM

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
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Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500
Lab ID: 23091975-001
Client Sample ID: 23091500-001

Collection Date: 9/19/2023 11:35:00 AM
Matrix: NON-POTABLE WATER

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	1.05	2.00	U	pCi/L	± 0.61	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.2	1.00	U	pCi/L	± 0.09	1	10/16/2023 10:09:00 A
Yield	1					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.85	1.00	J	pCi/L	± 0.52	1	10/13/2023 2:22:00 PM
Yield	1					1	10/13/2023 2:22:00 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
	ND	Not Detected	OG1	
	P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/19/2023 12:55:00 PM
Project: 23091500
Lab ID: 23091975-002
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-002

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	1.04	2.00	U	pCi/L	± 0.58	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.23	1.00	U	pCi/L	± 0.09	1	10/16/2023 10:09:00 A
Yield	1					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.81	1.00	JQDR	pCi/L	± 0.49	1	10/13/2023 2:22:00 PM
Yield	0.97					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/19/2023 1:50:00 PM
Project: 23091500
Lab ID: 23091975-003
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-003

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	1.1	2.00	U	pCi/L	± 0.69	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.11	1.00	U	pCi/L	± 0.07	1	10/16/2023 10:09:00 A
Yield	1					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.99	1.00	JQDR	pCi/L	± 0.62	1	10/13/2023 2:22:00 PM
Yield	0.94					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
3310 Win St.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/19/2023 2:50:00 PM
Project: 23091500
Lab ID: 23091975-004
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-004

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	4.83	2.00		pCi/L	± 1.05	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.59	1.00	U	pCi/L	± 0.14	1	10/16/2023 10:09:00 A
Yield	1					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	4.24	1.00		pCi/L	± 0.91	1	10/23/2023 2:46:00 PM
Yield	1					1	10/23/2023 2:46:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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3310 Win St.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500
Lab ID: 23091975-005
Client Sample ID: 23091500-005

Collection Date: 9/19/2023 4:00:00 PM
Matrix: NON-POTABLE WATER

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	0.82	2.00	U	pCi/L	± 0.58	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.21	1.00	U	pCi/L	± 0.09	1	10/16/2023 10:09:00 A
Yield	1					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.61	1.00	U	pCi/L	± 0.49	1	10/13/2023 2:22:00 PM
Yield	1					1	10/13/2023 2:22:00 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
	ND	Not Detected	OG1	
	P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500
Lab ID: 23091975-006
Client Sample ID: 23091500-006

Collection Date: 9/20/2023 8:50:00 AM
Matrix: NON-POTABLE WATER

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	0.73	2.00	U	pCi/L	± 0.49	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.32	1.00	U	pCi/L	± 0.11	1	10/16/2023 10:09:00 A
Yield	0.98					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.41	1.00	U	pCi/L	± 0.38	1	10/23/2023 2:46:00 PM
Yield	1					1	10/23/2023 2:46:00 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
	MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
	ND	Not Detected	OG1	
	P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/20/2023 10:05:00 AM
Project: 23091500
Lab ID: 23091975-007
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-007

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	2.8	2.00		pCi/L	± 0.85	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.18	1.00	U	pCi/L	± 0.09	1	10/16/2023 10:09:00 A
Yield	0.98					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	2.62	1.00		pCi/L	± 0.76	1	10/13/2023 2:22:00 PM
Yield	1					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
3310 Win St.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/20/2023 11:25:00 AM
Project: 23091500
Lab ID: 23091975-008
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-008

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	6.34	2.00		pCi/L	± 1.53	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.49	1.00	U	pCi/L	± 0.13	1	10/16/2023 10:09:00 A
Yield	0.96					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	5.85	1.00	*	pCi/L	± 1.14	1	10/13/2023 2:22:00 PM
Yield	0.97					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500
Lab ID: 23091975-009
Client Sample ID: 23091500-009

Collection Date: 9/20/2023 2:00:00 PM
Matrix: NON-POTABLE WATER

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	1.17	2.00	U	pCi/L	± 0.65	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0	1.00	U	pCi/L	± 0.05	1	10/16/2023 10:09:00 A
Yield	0.97					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	1.17	1.00		pCi/L	± 0.6	1	10/13/2023 2:22:00 PM
Yield	0.96					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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3310 Win St.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/20/2023 12:30:00 PM
Project: 23091500
Lab ID: 23091975-010
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-010

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	4.09	2.00		pCi/L	± 1.05	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.38	1.00	U	pCi/L	± 0.12	1	10/16/2023 10:09:00 A
Yield	0.97					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	3.71	1.00		pCi/L	± 0.93	1	10/13/2023 2:22:00 PM
Yield	0.99					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
3310 Win St.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/20/2023 3:10:00 PM
Project: 23091500
Lab ID: 23091975-011
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-011

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	0.64	2.00	U	pCi/L	± 0.67	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.32	1.00	U	pCi/L	± 0.11	1	10/16/2023 10:09:00 A
Yield	0.93					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.32	1.00	U	pCi/L	± 0.56	1	10/13/2023 2:22:00 PM
Yield	0.94					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Collection Date: 9/20/2023 4:10:00 PM
Project: 23091500
Lab ID: 23091975-012
Matrix: NON-POTABLE WATER
Client Sample ID: 23091500-012

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	1.27	2.00	U	pCi/L	± 0.74	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.09	1.00	U	pCi/L	± 0.07	1	10/16/2023 10:09:00 A
Yield	0.91					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	1.18	1.00		pCi/L	± 0.67	1	10/13/2023 2:22:00 PM
Yield	0.93					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,

Collection Date: 9/19/2023 8:40:00 AM

Project: 23091500

Lab ID: 23091975-013

Matrix: NON-POTABLE WATER

Client Sample ID: 23091500-013

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)				**CALCULATION**			Analyst: **CXS**
Radium-226/Radium-228	0.94	2.00	U	pCi/L	± 0.73	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	-0.02	1.00	U	pCi/L	± 0.05	1	10/16/2023 10:09:00 A
Yield	0.97					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.94	1.00	J	pCi/L	± 0.68	1	10/13/2023 2:22:00 PM
Yield	0.98					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
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Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500
Lab ID: 23091975-014
Client Sample ID: 23091500-014

Collection Date: 9/20/2023 12:01:00 AM
Matrix: NON-POTABLE WATER

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	0.78	2.00	U	pCi/L	± 0.84	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	0.36	1.00	U	pCi/L	± 0.13	1	10/16/2023 10:09:00 A
Yield	0.79					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.42	1.00	U	pCi/L	± 0.71	1	10/13/2023 2:22:00 PM
Yield	0.76					1	10/13/2023 2:22:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

Summit Environmental Technologies, Inc.
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Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **23091975**

Date Reported: **10/30/2023**

CLIENT: TEKLAB Inc,
Project: 23091500
Lab ID: 23091975-015
Client Sample ID: 23091500-015

Collection Date: 9/20/2023 12:02:00 AM
Matrix: NON-POTABLE WATER

Analyses	Result	PQL	Qual	Units	Uncertainty	DF	Date Analyzed
COMBINED RADIUM (EPA903+904)					**CALCULATION**		Analyst: **CXS**
Radium-226/Radium-228	0.22	2.00	U	pCi/L	± 0.46	1	10/27/2023 8:17:34 AM
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **HDJ**
Radium-226	-0.02	1.00	U	pCi/L	± 0.05	1	10/16/2023 10:09:00 A
Yield	0.96					1	10/16/2023 10:09:00 A
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **HDJ**
Radium-228	0.22	1.00	U	pCi/L	± 0.41	1	10/23/2023 2:46:00 PM
Yield	1					1	10/23/2023 2:46:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MC	Value is below Minimum Compound Limit.	N	Tentatively identified compounds
ND	Not Detected	OG1	
P	Second column confirmation exceeds	PL	Permit Limit

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QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69189**

Sample ID: **23091975-001AMS** SampType: **MS** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **23091500-001** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657493**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	4.70	1.00	5.000	0.8500	77.0	70	130				
Yield	0.970			1.000	0						

Sample ID: **23091975-002ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **23091500-002** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657496**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.24	1.00		0	0			0.8100	200	30	RU
Yield	1			0	0			0.9700	3.05		

Sample ID: **23091975-003ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **23091500-003** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657498**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.69	1.00		0	0			0.9900	35.7	30	JR
Yield	0.97			0	0			0.9400	3.14		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69189**

Sample ID: **MB-69189** SampType: **MBLK** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **PBW** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657487**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.910	1.00		0	0						J
Yield	1.00			0	0						

Sample ID: **LCS-69189** SampType: **LCS** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **LCSW** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657488**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.60	1.00	5.000	0	72.0	70	130				
Yield	0.970			0	0						

Sample ID: **RLC-69189** SampType: **RLC** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **BatchQC** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657491**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.830	1.00	1.000	0	83.0	50	150				J
Yield	1.00			0	0						

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69189**

Sample ID: **RLCD-69189** SampType: **RLC** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172738**
Client ID: **BatchQC** Batch ID: **69189** TestNo: **E904.0** **E903-904** Analysis Date: **10/13/2023** SeqNo: **4657492**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.710	1.00	1.000	0	71.0	50	150				J
Yield	1.00			0	0						

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

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QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69189**

Sample ID: **23091975-001AMS** SampType: **MS** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172765**
Client ID: **23091500-001** Batch ID: **69189** TestNo: **E903.0** **E903-904** Analysis Date: **10/16/2023** SeqNo: **4658312**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.71	1.00	5.000	0	94.2	70	130				

Sample ID: **23091975-002ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172765**
Client ID: **23091500-002** Batch ID: **69189** TestNo: **E903.0** **E903-904** Analysis Date: **10/16/2023** SeqNo: **4658315**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	0.19	1.00						0	0	30	U
Yield	0.99							1.000	1.01	0	

Sample ID: **23091975-003ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **10/3/2023** RunNo: **172765**
Client ID: **23091500-003** Batch ID: **69189** TestNo: **E903.0** **E903-904** Analysis Date: **10/16/2023** SeqNo: **4658317**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	0.24	1.00						0	0	30	U
Yield	0.99							1.000	1.01	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69189**

Sample ID: **MB-69189**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **10/3/2023**	RunNo: **172765**
Client ID: **PBW**	Batch ID: **69189**	TestNo: **E903.0**	**E903-904**	Analysis Date: **10/16/2023**	SeqNo: **4658306**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									U
Yield	0.920										

Sample ID: **LCS-69189**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **10/3/2023**	RunNo: **172765**
Client ID: **LCSW**	Batch ID: **69189**	TestNo: **E903.0**	**E903-904**	Analysis Date: **10/16/2023**	SeqNo: **4658307**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.06	1.00	5.000	0	101	70	130				

Sample ID: **LCSD-69189**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **10/3/2023**	RunNo: **172765**
Client ID: **LCSS02**	Batch ID: **69189**	TestNo: **E903.0**	**E903-904**	Analysis Date: **10/16/2023**	SeqNo: **4658308**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.60	1.00	5.000	0	92.0	70	130	5.060	9.52	20	

Sample ID: **RLC-69189**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **10/3/2023**	RunNo: **172765**
Client ID: **BatchQC**	Batch ID: **69189**	TestNo: **E903.0**	**E903-904**	Analysis Date: **10/16/2023**	SeqNo: **4658310**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69189**

Sample ID: **RLC-69189**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **10/3/2023**	RunNo: **172765**
Client ID: **BatchQC**	Batch ID: **69189**	TestNo: **E903.0**	**E903-904**	Analysis Date: **10/16/2023**	SeqNo: **4658310**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	0.980	1.00	1.000	0	98.0	50	150				J

Sample ID: **RLCD-69189**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **10/3/2023**	RunNo: **172765**
Client ID: **BatchQC**	Batch ID: **69189**	TestNo: **E903.0**	**E903-904**	Analysis Date: **10/16/2023**	SeqNo: **4658311**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.06	1.00	1.000	0	106	50	150				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23091975**

30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69650**

Sample ID: **MB-69650**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **10/17/2023**	RunNo: **173444**
Client ID: **PBW**	Batch ID: **69650**	TestNo: **E904.0**	**E903-904**	Analysis Date: **10/23/2023**	SeqNo: **4682310**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						U
Yield	1.00			0	0						

Sample ID: **LCS-69650**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **10/17/2023**	RunNo: **173444**
Client ID: **LCSW**	Batch ID: **69650**	TestNo: **E904.0**	**E903-904**	Analysis Date: **10/23/2023**	SeqNo: **4682311**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	5.99	1.00	5.000	0	120	70	130				
Yield	1.00			0	0						

Sample ID: **RLCD-69650**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **10/17/2023**	RunNo: **173444**
Client ID: **BatchQC**	Batch ID: **69650**	TestNo: **E904.0**	**E903-904**	Analysis Date: **10/23/2023**	SeqNo: **4682315**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	1.24	1.00	1.000	0	124	50	150				
Yield	1.00			0	0						

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **23091975**
30-Oct-23

Client: TEKLAB Inc,
Project: 23091500 **BatchID:** **69650**

Sample ID: **23101248-001AMS** SampType: **MS** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **10/17/2023** RunNo: **173444**
Client ID: **BatchQC** Batch ID: **69650** TestNo: **E904.0** **E903-904** Analysis Date: **10/23/2023** SeqNo: **4682316**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	2.36	1.00	5.000	1.290	21.4	70	130				S
Yield	1.00			1.000	0						

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analy
J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response	MC	Value is below Minimum Compound
ND	Not Detected	OG1		P	Second column confirmation exceeds
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Original

Pg ___ of ___ 23091975

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: ___ Sampler: ___ QC Level: 3

Project# 23091500

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium (226, 228, and combined) by method EPA903.0/904.0
on standard TAT Please include negative values (no ND).
Batch QC and CCR EDD are required. Receipt summary requested.

Contact: Elizabeth Hurley
Email: ehurley@teklabinc.com
Requested Due Date: 20 business days or less
Billing/PO: 35072
Phone: 618-344-1004 ext 33
State of Origin: MO

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226	Radium 228	Combined Radium	pH	CPM
	23091500-001	9/19/23 11:35	HNO3	Groundwater	✓	✓	✓		
	23091500-002	9/19/23 12:55	HNO3	Groundwater	✓	✓	✓		
	23091500-003	9/19/23 13:50	HNO3	Groundwater	✓	✓	✓		
	23091500-004	9/19/23 14:50	HNO3	Groundwater	✓	✓	✓		
	23091500-005	9/19/23 16:00	HNO3	Groundwater	✓	✓	✓		
	23091500-006	9/20/23 08:50	HNO3	Groundwater	✓	✓	✓		
	23091500-007	9/20/23 10:05	HNO3	Groundwater	✓	✓	✓		
	23091500-008	9/20/23 11:25	HNO3	Groundwater	✓	✓	✓		
	23091500-009	9/20/23 14:00	HNO3	Groundwater	✓	✓	✓		
	23091500-010	9/20/23 12:30	HNO3	Groundwater	✓	✓	✓		
	23091500-011	9/20/23 15:10	HNO3	Groundwater	✓	✓	✓		

*Relinquished By	Date/Time	Received By	Date/Time
[signature]	9/21/23 1700		
		[illegible signature]	9-28-23/1245

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization, and proprietary rights. Teklab, Inc. protects clients' confidential information as directed by local, state or federal laws. (Teklab QAM Section 9.1, TNI V1 M2 Section 4.1.5 c)

SubCocRevA 3/2/2016

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: Sampler: QC Level: 3

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium (226, 228, and combined) by method EPA903.0/904.0
on standard TAT Please include negative values (no ND).
Batch QC and CCR EDD are required. Receipt summary requested.

Project# 23091500

Contact: Elizabeth Hurley
Email: ehurley@teklabinc.com
Requested Due Date: 20 business days or less
Billing/PO: 35072
Phone: 618-344-1004 ext 33
State of Origin: MO

PLEASE NOTE:
NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.
Changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226	Radium 228	Combined Radium	pH	CPM
	23091500-012	9/20/23 16:10	HNO3	Groundwater	✔	✔	✔	1	31 29
	23091500-013	9/19/23 08.40	HNO3	Groundwater	✔	✔	✔	1	37 15
	23091500-014	9/20/23 00:01	HNO3	Groundwater	✔	✔	✔	1	21 23
	23091500-015	9/20/23 00:02	HNO3	Groundwater	✔	✔	✔	1	33 26
			HNO3	Groundwater					
			HNO3	Groundwater					
			HNO3	Groundwater					
			HNO3	Groundwater					
			HNO3	Groundwater					
			HNO3	Groundwater					
			HNO3	Groundwater					

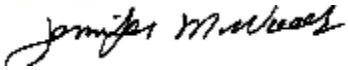
*Relinquished By	Date/Time	Received By	Date/Time
[signature]	9/21/23 1100		
		[signature]	9-21-23/12:45

SubCocRevA 3/2/2016

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: **TEK-IL-62234-A** Work Order Number: **23091975** RcptNo: **1**

Logged by:	**Anthony W. Britton**	**9/28/2023 12:45:00 PM**	
Completed By:	**Anthony W. Britton**	**9/29/2023 8:19:46 AM**	
Reviewed By:	**Jennifer Woolf**	**9/29/2023 12:20:29 PM**	

Chain of Custody

1.	Were seals intact?	Yes ☑	No ☐	Not Present ☐
2.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3.	How was the sample delivered?	FedEx		

Log In

4.	Coolers are present?	Yes ☐	No ☑	NA ☐
5.	Was an attempt made to cool the samples?	Yes ☐	No ☑	NA ☐
6.	Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☑	NA ☐
		Not required		
7.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
8.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
9.	Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
10.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
11.	Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes ☐	No ☐	No VOA Vials ☑
12.	Were any sample containers received broken?	Yes ☐	No ☑	
13.	Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
14.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
15.	Is it clear what analyses were requested?	Yes ☑	No ☐	
16.	Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	18.7	Good	Not Present			
2	18.9	Good	Not Present			
3	19.0	Good	Not Present			

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: **TEK-IL-62234-A** Work Order Number: **23091975** RcptNo: **1**

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
4	19.3	Good	Not Present			

January 02, 2024

Clay Sansoucie
ERM
1968 Craig Road
Suite 100
St. Louis, MO 63146
TEL: (314) 956-0269
FAX:

Illinois	100226
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: 0599247 **WorkOrder:** 23112078

Dear Clay Sansoucie:

TEKLAB, INC received 15 samples on 11/29/2023 2:30:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

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

Sincerely,

Elizabeth A. Hurley
Director of Customer Service
(618)344-1004 ex 33
ehurley@teklabinc.com

Report Contents

http://www.teklabinc.com/

Client: ERM
Client Project: 0599247

Work Order: 23112078
Report Date: 02-Jan-24

This reporting package includes the following:

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Abbr Definition

Abbr	Definition
*	Analytes on report marked with an asterisk are not NELAP accredited
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
CRQL	A Client Requested Quantitation Limit is a reporting limit that varies according to customer request. The CRQL may not be less than the MDL.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilution factors.
DNI	Did not ignite
DUP	Laboratory duplicate is a replicate aliquot prepared under the same laboratory conditions and independently analyzed to obtain a measure of precision.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample is a sample matrix, free from the analytes of interest,spiked with verified known amounts of analytes and analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MBLK	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	"The method detection limit is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results."
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
NC	Data is not acceptable for compliance purposes
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions.
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TIC	Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
TNTC	Too numerous to count (> 200 CFU)

Definitions

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Qualifiers

- Unknown hydrocarbon

B - Analyte detected in associated Method Blank

C - RL shown is a Client Requested Quantitation Limit

E - Value above quantitation range

H - Holding times exceeded

I - Associated internal standard was outside method criteria

J - Analyte detected below quantitation limits

M - Manual Integration used to determine area response

ND - Not Detected at the Reporting Limit

R - RPD outside accepted recovery limits

S - Spike Recovery outside recovery limits

T - TIC(Tentatively identified compound)

X - Value exceeds Maximum Contaminant Level

Case Narrative

http://www.teklabinc.com/

Client: ERM
Client Project: 0599247

Work Order: 23112078
Report Date: 02-Jan-24

Cooler Receipt Temp: 3.0 °C

Ra226/228 analyses were performed by Summit Environmental Technologies, Inc. See attached report for results and QC.

Locations

Collinsville

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email jhriley@teklabinc.com

Springfield

Address 3920 Pintail Dr
Springfield, IL 62711-9415
Phone (217) 698-1004
Fax (217) 698-1005
Email KKlostermann@teklabinc.com

Kansas City

Address 8421 Nieman Road
Lenexa, KS 66214
Phone (913) 541-1998
Fax (913) 541-1998
Email jhriley@teklabinc.com

Collinsville Air

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email EHurley@teklabinc.com

Chicago

Address 1319 Butterfield Rd.
Downers Grove, IL 60515
Phone (630) 324-6855
Fax
Email arenner@teklabinc.com

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2024	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2024	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2024	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2024	Collinsville
Kentucky	UST	0073		1/31/2024	Collinsville
Missouri	MDNR	00930		5/31/2023	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-001 **Client Sample ID:** APW-03-WG-20231127

Matrix: GROUNDWATER **Collection Date:** 11/27/2023 14:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**556**	mg/L	1	11/30/2023 10:29	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**133**	mg/L	10	12/01/2023 20:46	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.24**		1	11/30/2023 15:19	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.24**	mg/L	1	11/30/2023 10:13	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**11**	mg/L	1	12/01/2023 20:36	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**0.0018**	mg/L	5	12/11/2023 9:48	215495
Arsenic	NELAP	0.0010		**0.0013**	mg/L	5	12/05/2023 19:36	215495
Barium	NELAP	0.0010		**0.122**	mg/L	5	12/05/2023 19:36	215495
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:36	215495
Boron	NELAP	0.0250		**1.69**	mg/L	5	12/05/2023 19:36	215495
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:36	215495
Calcium	NELAP	0.125		**111**	mg/L	5	12/07/2023 11:49	215495
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/08/2023 11:38	215495
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:36	215495
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:36	215495
Lithium	*	0.0030		**0.0256**	mg/L	5	12/05/2023 19:36	215495
Molybdenum	NELAP	0.0015		**0.0303**	mg/L	5	12/07/2023 11:49	215495
Selenium	NELAP	0.0010		**0.0012**	mg/L	5	12/05/2023 19:36	215495
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 19:36	215495
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:29	215460
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	12/05/2023 21:02	215460
Barium	NELAP	0.0010		**0.167**	mg/L	5	12/05/2023 21:02	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:02	215460
Boron	NELAP	0.0250		**2.22**	mg/L	5	12/05/2023 21:02	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:02	215460
Calcium	NELAP	0.125		**115**	mg/L	5	12/07/2023 13:09	215460
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/08/2023 12:03	215460
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:02	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:02	215460
Lithium	*	0.0030		**0.0324**	mg/L	5	12/05/2023 21:02	215460
Molybdenum	NELAP	0.0015		**0.0319**	mg/L	5	12/07/2023 13:09	215460
Selenium	NELAP	0.0010		**0.0019**	mg/L	5	12/05/2023 21:02	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 21:02	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:09	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-002 **Client Sample ID:** APW-10D-WG-20231127

Matrix: GROUNDWATER **Collection Date:** 11/27/2023 15:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**445**	mg/L	2.5	11/30/2023 10:29	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**26**	mg/L	1	12/01/2023 20:57	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.08**		1	11/30/2023 15:21	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.14**	mg/L	1	11/30/2023 10:16	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**10**	mg/L	1	12/01/2023 20:57	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**0.0013**	mg/L	5	12/06/2023 11:51	215379
Arsenic	NELAP	0.0010		**0.0018**	mg/L	5	12/04/2023 18:20	215379
Barium	NELAP	0.0010		**0.448**	mg/L	5	12/04/2023 18:20	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:20	215379
Boron	NELAP	0.0250		**0.0823**	mg/L	5	12/04/2023 18:20	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:20	215379
Calcium	NELAP	0.125		**83.4**	mg/L	5	12/07/2023 9:58	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 18:20	215379
Cobalt	NELAP	0.0010		**0.0038**	mg/L	5	12/04/2023 18:20	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:20	215379
Lithium	*	0.0030		**0.0176**	mg/L	5	12/04/2023 18:20	215379
Molybdenum	NELAP	0.0015		**0.0025**	mg/L	5	12/04/2023 18:20	215379
Selenium	NELAP	0.0010		**0.0043**	mg/L	5	12/04/2023 18:20	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 18:20	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:33	215460
Arsenic	NELAP	0.0010		**0.0021**	mg/L	5	12/05/2023 21:08	215460
Barium	NELAP	0.0010		**0.398**	mg/L	5	12/05/2023 21:08	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:08	215460
Boron	NELAP	0.0250		**0.0754**	mg/L	5	12/05/2023 21:08	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:08	215460
Calcium	NELAP	0.125		**120**	mg/L	5	12/07/2023 13:15	215460
Chromium	NELAP	0.0015		**0.0021**	mg/L	5	12/08/2023 12:53	215460
Cobalt	NELAP	0.0010		**0.0039**	mg/L	5	12/05/2023 21:08	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:08	215460
Lithium	*	0.0030		**0.0154**	mg/L	5	12/05/2023 21:08	215460
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/07/2023 13:15	215460
Selenium	NELAP	0.0010		**0.0033**	mg/L	5	12/05/2023 21:08	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 21:08	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:11	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-003 **Client Sample ID:** APW-10S-WG-20231127

Matrix: GROUNDWATER **Collection Date:** 11/27/2023 16:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	100		**900**	mg/L	5	11/30/2023 10:30	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	12/01/2023 21:22	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.01**		1	11/30/2023 15:22	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.18**	mg/L	1	11/30/2023 10:19	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**20**	mg/L	1	12/01/2023 21:21	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 11:57	215379
Arsenic	NELAP	0.0010		**0.251**	mg/L	5	12/04/2023 18:26	215379
Barium	NELAP	0.0010		**0.711**	mg/L	5	12/04/2023 18:26	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:26	215379
Boron	NELAP	0.0250		**0.682**	mg/L	5	12/04/2023 18:26	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:26	215379
Calcium	NELAP	0.125		**137**	mg/L	5	12/07/2023 10:04	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 18:26	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:26	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:26	215379
Lithium	*	0.0030		**0.0359**	mg/L	5	12/04/2023 18:26	215379
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 18:26	215379
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:26	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 18:26	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:53	215460
Arsenic	NELAP	0.0010		**0.276**	mg/L	5	12/05/2023 21:33	215460
Barium	NELAP	0.0010		**0.804**	mg/L	5	12/05/2023 21:33	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:33	215460
Boron	NELAP	0.0250		**0.555**	mg/L	5	12/07/2023 15:11	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:33	215460
Calcium	NELAP	0.125	S	**129**	mg/L	5	12/07/2023 15:11	215460
Chromium	NELAP	0.0015		**0.0016**	mg/L	5	12/12/2023 9:35	215460
Cobalt	NELAP	0.0010		**0.0013**	mg/L	5	12/05/2023 21:33	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:33	215460
Lithium	*	0.0030		**0.0401**	mg/L	5	12/05/2023 21:33	215460
Molybdenum	NELAP	0.0015		**0.0021**	mg/L	5	12/07/2023 15:11	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:33	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 21:33	215460
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:13	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-004 **Client Sample ID:** APW-06S-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 9:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**635**	mg/L	2.5	11/30/2023 10:30	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**237**	mg/L	10	12/01/2023 21:34	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.12**		1	11/30/2023 15:24	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.33**	mg/L	1	11/30/2023 10:22	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**22**	mg/L	1	12/01/2023 21:29	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 12:02	215379
Arsenic	NELAP	0.0010		**0.0019**	mg/L	5	12/04/2023 18:32	215379
Barium	NELAP	0.0010		**0.269**	mg/L	5	12/04/2023 18:32	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:32	215379
Boron	NELAP	0.0250		**8.41**	mg/L	5	12/04/2023 18:32	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:32	215379
Calcium	NELAP	0.125		**88.8**	mg/L	5	12/07/2023 10:10	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 18:32	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:32	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:32	215379
Lithium	*	0.0030		**0.0498**	mg/L	5	12/04/2023 18:32	215379
Molybdenum	NELAP	0.0015		**0.309**	mg/L	5	12/04/2023 18:32	215379
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:32	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 18:32	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:37	215460
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	12/05/2023 21:14	215460
Barium	NELAP	0.0010		**0.305**	mg/L	5	12/05/2023 21:14	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:14	215460
Boron	NELAP	0.0250		**9.19**	mg/L	5	12/05/2023 21:14	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:14	215460
Calcium	NELAP	0.125		**90.0**	mg/L	5	12/07/2023 13:21	215460
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/12/2023 9:00	215460
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:14	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:14	215460
Lithium	*	0.0030		**0.0564**	mg/L	5	12/05/2023 21:14	215460
Molybdenum	NELAP	0.0015		**0.207**	mg/L	5	12/07/2023 13:21	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:14	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 21:14	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:16	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-005 **Client Sample ID:** APW-06D-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 10:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**560**	mg/L	2.5	11/30/2023 10:31	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**184**	mg/L	10	12/01/2023 21:42	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.36**		1	11/30/2023 15:26	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.24**	mg/L	1	11/30/2023 10:24	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**22**	mg/L	1	12/01/2023 21:37	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 12:07	215379
Arsenic	NELAP	0.0010		**0.0161**	mg/L	5	12/04/2023 18:38	215379
Barium	NELAP	0.0010		**0.185**	mg/L	5	12/04/2023 18:38	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:38	215379
Boron	NELAP	0.0250		**4.67**	mg/L	5	12/04/2023 18:38	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:38	215379
Calcium	NELAP	0.125		**80.3**	mg/L	5	12/07/2023 10:16	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 18:38	215379
Cobalt	NELAP	0.0010		**0.0012**	mg/L	5	12/04/2023 18:38	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:38	215379
Lithium	*	0.0030		**0.0241**	mg/L	5	12/04/2023 18:38	215379
Molybdenum	NELAP	0.0015		**0.0949**	mg/L	5	12/04/2023 18:38	215379
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:38	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 18:38	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:41	215460
Arsenic	NELAP	0.0010		**0.0135**	mg/L	5	12/05/2023 21:21	215460
Barium	NELAP	0.0010		**0.151**	mg/L	5	12/05/2023 21:21	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:21	215460
Boron	NELAP	0.0250		**3.80**	mg/L	5	12/05/2023 21:21	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:21	215460
Calcium	NELAP	0.125		**98.4**	mg/L	5	12/07/2023 13:27	215460
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/12/2023 9:05	215460
Cobalt	NELAP	0.0010		**0.0013**	mg/L	5	12/05/2023 21:21	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:21	215460
Lithium	*	0.0030		**0.0199**	mg/L	5	12/05/2023 21:21	215460
Molybdenum	NELAP	0.0015		**0.0557**	mg/L	5	12/07/2023 13:27	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:21	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 21:21	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:18	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-006 **Client Sample ID:** APW-05R-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 12:05

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**705**	mg/L	2.5	11/30/2023 10:31	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**330**	mg/L	10	12/01/2023 21:50	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.33**		1	11/30/2023 15:27	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.38**	mg/L	1	11/30/2023 10:35	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**16**	mg/L	1	12/01/2023 21:45	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 12:12	215379
Arsenic	NELAP	0.0010		**0.0029**	mg/L	5	12/04/2023 18:44	215379
Barium	NELAP	0.0010		**0.186**	mg/L	5	12/04/2023 18:44	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:44	215379
Boron	NELAP	0.0250		**8.71**	mg/L	5	12/04/2023 18:44	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:44	215379
Calcium	NELAP	0.125		**98.4**	mg/L	5	12/07/2023 10:22	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 18:44	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:44	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:44	215379
Lithium	*	0.0030		**0.0455**	mg/L	5	12/04/2023 18:44	215379
Molybdenum	NELAP	0.0015		**0.282**	mg/L	5	12/04/2023 18:44	215379
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 18:44	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 18:44	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:45	215460
Arsenic	NELAP	0.0010		**0.0042**	mg/L	5	12/05/2023 21:27	215460
Barium	NELAP	0.0010		**0.225**	mg/L	5	12/05/2023 21:27	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:27	215460
Boron	NELAP	0.0250		**9.62**	mg/L	5	12/05/2023 21:27	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:27	215460
Calcium	NELAP	0.125		**97.1**	mg/L	5	12/07/2023 13:33	215460
Chromium	NELAP	0.0015		**0.0020**	mg/L	5	12/12/2023 9:10	215460
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:27	215460
Lead	NELAP	0.0010		**0.0020**	mg/L	5	12/05/2023 21:27	215460
Lithium	*	0.0030		**0.0523**	mg/L	5	12/05/2023 21:27	215460
Molybdenum	NELAP	0.0015		**0.203**	mg/L	5	12/07/2023 13:33	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 21:27	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 21:27	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:20	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-007 **Client Sample ID:** APW-02-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 13:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**920**	mg/L	2.5	11/30/2023 10:31	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**440**	mg/L	10	12/01/2023 21:58	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.11**		1	11/30/2023 15:29	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.26**	mg/L	1	11/30/2023 10:37	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**8**	mg/L	1	12/01/2023 21:53	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 13:36	215379
Arsenic	NELAP	0.0010		**0.0168**	mg/L	5	12/04/2023 20:03	215379
Barium	NELAP	0.0010		**0.205**	mg/L	5	12/04/2023 20:03	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 20:03	215379
Boron	NELAP	0.0250	S	**9.57**	mg/L	5	12/04/2023 20:03	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 20:03	215379
Calcium	NELAP	0.125	S	**121**	mg/L	5	12/07/2023 12:08	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 20:03	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 20:03	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 20:03	215379
Lithium	*	0.0030		**0.0506**	mg/L	5	12/04/2023 20:03	215379
Molybdenum	NELAP	0.0015		**0.205**	mg/L	5	12/04/2023 20:03	215379
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 20:03	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 20:03	215379
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 10:49	215460
Arsenic	NELAP	0.0010		**0.0237**	mg/L	5	12/05/2023 22:16	215460
Barium	NELAP	0.0010		**0.303**	mg/L	5	12/05/2023 22:16	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:16	215460
Boron	NELAP	0.0250		**9.62**	mg/L	5	12/05/2023 22:16	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:16	215460
Calcium	NELAP	0.125		**132**	mg/L	5	12/07/2023 14:28	215460
Chromium	NELAP	0.0015		**0.0092**	mg/L	5	12/12/2023 9:15	215460
Cobalt	NELAP	0.0010		**0.0027**	mg/L	5	12/12/2023 9:15	215460
Lead	NELAP	0.0010		**0.0057**	mg/L	5	12/05/2023 22:16	215460
Lithium	*	0.0030		**0.0560**	mg/L	5	12/05/2023 22:16	215460
Molybdenum	NELAP	0.0015		**0.147**	mg/L	5	12/07/2023 14:28	215460
Selenium	NELAP	0.0010		**0.0015**	mg/L	5	12/12/2023 9:15	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:16	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:22	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-008 **Client Sample ID:** APW-07-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 15:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**790**	mg/L	2.5	11/30/2023 10:32	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**40**	mg/L	1	12/01/2023 22:17	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.86**		1	11/30/2023 15:32	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.20**	mg/L	1	11/30/2023 10:40	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**11**	mg/L	1	12/01/2023 22:17	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 12:17	215379
Arsenic	NELAP	0.0010		**0.0016**	mg/L	5	12/04/2023 19:33	215379
Barium	NELAP	0.0010		**0.465**	mg/L	5	12/04/2023 19:33	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:33	215379
Boron	NELAP	0.0250		**0.243**	mg/L	5	12/04/2023 19:33	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:33	215379
Calcium	NELAP	0.125		**162**	mg/L	5	12/07/2023 10:28	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 19:33	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:33	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:33	215379
Lithium	*	0.0030		**0.0212**	mg/L	5	12/04/2023 19:33	215379
Molybdenum	NELAP	0.0015		**0.0040**	mg/L	5	12/04/2023 19:33	215379
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:33	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 19:33	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:24	215460
Arsenic	NELAP	0.0010		**0.0022**	mg/L	5	12/05/2023 22:22	215460
Barium	NELAP	0.0010		**0.522**	mg/L	5	12/05/2023 22:22	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:22	215460
Boron	NELAP	0.0250		**0.274**	mg/L	5	12/05/2023 22:22	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:22	215460
Calcium	NELAP	0.125		**177**	mg/L	5	12/07/2023 14:34	215460
Chromium	NELAP	0.0015		**0.0024**	mg/L	5	12/12/2023 9:20	215460
Cobalt	NELAP	0.0010		**0.0013**	mg/L	5	12/12/2023 9:20	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:22	215460
Lithium	*	0.0030		**0.0231**	mg/L	5	12/05/2023 22:22	215460
Molybdenum	NELAP	0.0015		**0.0042**	mg/L	5	12/07/2023 14:34	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/12/2023 9:20	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:22	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:35	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-009 **Client Sample ID:** APW-08-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 16:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**395**	mg/L	2.5	11/30/2023 10:32	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**24**	mg/L	1	12/01/2023 22:25	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.27**		1	11/30/2023 15:34	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.29**	mg/L	1	11/30/2023 10:43	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**11**	mg/L	1	12/01/2023 22:25	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 13:20	215379
Arsenic	NELAP	0.0010		**0.0019**	mg/L	5	12/04/2023 19:39	215379
Barium	NELAP	0.0010		**0.255**	mg/L	5	12/04/2023 19:39	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:39	215379
Boron	NELAP	0.0250		**0.154**	mg/L	5	12/04/2023 19:39	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:39	215379
Calcium	NELAP	0.125		**71.3**	mg/L	5	12/07/2023 10:34	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 19:39	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:39	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:39	215379
Lithium	*	0.0030		**0.0204**	mg/L	5	12/04/2023 19:39	215379
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 19:39	215379
Selenium	NELAP	0.0010		**0.0231**	mg/L	5	12/04/2023 19:39	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 19:39	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:28	215460
Arsenic	NELAP	0.0010		**0.0025**	mg/L	5	12/05/2023 22:28	215460
Barium	NELAP	0.0010		**0.261**	mg/L	5	12/05/2023 22:28	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:28	215460
Boron	NELAP	0.0250		**0.155**	mg/L	5	12/05/2023 22:28	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:28	215460
Calcium	NELAP	0.125		**81.2**	mg/L	5	12/07/2023 14:41	215460
Chromium	NELAP	0.0015		**0.0049**	mg/L	5	12/12/2023 9:25	215460
Cobalt	NELAP	0.0010		**0.0021**	mg/L	5	12/12/2023 9:25	215460
Lead	NELAP	0.0010		**0.0018**	mg/L	5	12/05/2023 22:28	215460
Lithium	*	0.0030		**0.0211**	mg/L	5	12/05/2023 22:28	215460
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/07/2023 14:41	215460
Selenium	NELAP	0.0010		**0.0221**	mg/L	5	12/12/2023 9:25	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:28	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:38	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-010 **Client Sample ID:** APW-04-WG-20231129

Matrix: GROUNDWATER **Collection Date:** 11/29/2023 8:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**430**	mg/L	1	11/30/2023 10:40	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	20		**54**	mg/L	2	12/05/2023 12:03	R340126
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.31**		1	11/30/2023 15:36	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.18**	mg/L	1	11/30/2023 10:45	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**11**	mg/L	1	12/01/2023 22:36	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 13:25	215379
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	12/04/2023 19:45	215379
Barium	NELAP	0.0010		**0.165**	mg/L	5	12/04/2023 19:45	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:45	215379
Boron	NELAP	0.0250		**0.645**	mg/L	5	12/04/2023 19:45	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:45	215379
Calcium	NELAP	0.125		**77.9**	mg/L	5	12/07/2023 10:41	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 19:45	215379
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:45	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:45	215379
Lithium	*	0.0030		**0.0333**	mg/L	5	12/04/2023 19:45	215379
Molybdenum	NELAP	0.0015		**0.0461**	mg/L	5	12/04/2023 19:45	215379
Selenium	NELAP	0.0010		**0.0139**	mg/L	5	12/04/2023 19:45	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 19:45	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:33	215460
Arsenic	NELAP	0.0010		**0.0028**	mg/L	5	12/05/2023 22:35	215460
Barium	NELAP	0.0010		**0.153**	mg/L	5	12/05/2023 22:35	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:35	215460
Boron	NELAP	0.0250		**0.559**	mg/L	5	12/05/2023 22:35	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:35	215460
Calcium	NELAP	0.125		**124**	mg/L	5	12/12/2023 9:30	215460
Chromium	NELAP	0.0015		**0.0033**	mg/L	5	12/12/2023 9:30	215460
Cobalt	NELAP	0.0010		**0.0012**	mg/L	5	12/12/2023 9:30	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:35	215460
Lithium	*	0.0030		**0.0298**	mg/L	5	12/05/2023 22:35	215460
Molybdenum	NELAP	0.0015		**0.0347**	mg/L	5	12/07/2023 14:47	215460
Selenium	NELAP	0.0010		**0.0150**	mg/L	5	12/12/2023 9:30	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:35	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:40	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-011 **Client Sample ID:** APW-01R-WG-20231129

Matrix: GROUNDWATER **Collection Date:** 11/29/2023 10:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**300**	mg/L	2.5	11/30/2023 10:41	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		**73**	mg/L	5	12/05/2023 12:40	R340126
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**6.59**		1	11/30/2023 15:41	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.17**	mg/L	1	11/30/2023 10:47	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**7**	mg/L	1	12/01/2023 23:10	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 13:31	215379
Arsenic	NELAP	0.0010		**0.0015**	mg/L	5	12/04/2023 19:51	215379
Barium	NELAP	0.0010		**0.245**	mg/L	5	12/04/2023 19:51	215379
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:51	215379
Boron	NELAP	0.0250		**0.279**	mg/L	5	12/04/2023 19:51	215379
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:51	215379
Calcium	NELAP	0.125		**57.6**	mg/L	5	12/07/2023 12:01	215379
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 19:51	215379
Cobalt	NELAP	0.0010		**0.0013**	mg/L	5	12/04/2023 19:51	215379
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/04/2023 19:51	215379
Lithium	*	0.0030		**0.0193**	mg/L	5	12/04/2023 19:51	215379
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/04/2023 19:51	215379
Selenium	NELAP	0.0010		**0.0058**	mg/L	5	12/04/2023 19:51	215379
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/04/2023 19:51	215379
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:37	215460
Arsenic	NELAP	0.0010		**0.0033**	mg/L	5	12/05/2023 22:41	215460
Barium	NELAP	0.0010		**0.259**	mg/L	5	12/05/2023 22:41	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:41	215460
Boron	NELAP	0.0250		**0.263**	mg/L	5	12/05/2023 22:41	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:41	215460
Calcium	NELAP	0.125		**94.3**	mg/L	5	12/12/2023 10:29	215460
Chromium	NELAP	0.0015		**0.0049**	mg/L	5	12/12/2023 10:29	215460
Cobalt	NELAP	0.0010		**0.0027**	mg/L	5	12/12/2023 10:29	215460
Lead	NELAP	0.0010		**0.0020**	mg/L	5	12/05/2023 22:41	215460
Lithium	*	0.0030		**0.0189**	mg/L	5	12/05/2023 22:41	215460
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/12/2023 10:29	215460
Selenium	NELAP	0.0010		**0.0054**	mg/L	5	12/12/2023 10:29	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:41	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:42	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-012 **Client Sample ID:** APW-09-WG-20231129

Matrix: GROUNDWATER **Collection Date:** 11/29/2023 11:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**380**	mg/L	1	12/01/2023 10:01	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**34**	mg/L	1	12/01/2023 23:18	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.50**		1	11/30/2023 15:43	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.20**	mg/L	1	11/30/2023 10:50	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**12**	mg/L	1	12/01/2023 23:18	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**0.0011**	mg/L	5	12/11/2023 9:52	215495
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	12/05/2023 19:42	215495
Barium	NELAP	0.0010		**0.109**	mg/L	5	12/05/2023 19:42	215495
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:42	215495
Boron	NELAP	0.0250		**0.169**	mg/L	5	12/05/2023 19:42	215495
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:42	215495
Calcium	NELAP	0.125		**73.5**	mg/L	5	12/07/2023 11:55	215495
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/08/2023 11:45	215495
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:42	215495
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:42	215495
Lithium	*	0.0030		**0.0121**	mg/L	5	12/05/2023 19:42	215495
Molybdenum	NELAP	0.0015		**0.0154**	mg/L	5	12/07/2023 11:55	215495
Selenium	NELAP	0.0010		**0.0163**	mg/L	5	12/05/2023 19:42	215495
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 19:42	215495
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:41	215460
Arsenic	NELAP	0.0010		**0.0026**	mg/L	5	12/05/2023 22:47	215460
Barium	NELAP	0.0010		**0.131**	mg/L	5	12/05/2023 22:47	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:47	215460
Boron	NELAP	0.0250		**0.191**	mg/L	5	12/05/2023 22:47	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:47	215460
Calcium	NELAP	0.125		**80.9**	mg/L	5	12/12/2023 10:34	215460
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/12/2023 10:34	215460
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/12/2023 10:34	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:47	215460
Lithium	*	0.0030		**0.0138**	mg/L	5	12/05/2023 22:47	215460
Molybdenum	NELAP	0.0015		**0.0188**	mg/L	5	12/12/2023 10:34	215460
Selenium	NELAP	0.0010		**0.0214**	mg/L	5	12/12/2023 10:34	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:47	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:45	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-013 **Client Sample ID:** DUP-01-WG-20231128

Matrix: GROUNDWATER **Collection Date:** 11/28/2023 0:01

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	50		**690**	mg/L	2.5	11/30/2023 10:40	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	100		**321**	mg/L	10	12/01/2023 23:32	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.34**		1	11/30/2023 15:45	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.35**	mg/L	1	11/30/2023 10:52	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**16**	mg/L	1	12/01/2023 23:26	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010	S	**< 0.0010**	mg/L	5	12/11/2023 10:00	215495
Arsenic	NELAP	0.0010		**0.0018**	mg/L	5	12/07/2023 13:39	215495
Barium	NELAP	0.0010		**0.127**	mg/L	5	12/07/2023 13:39	215495
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/07/2023 13:39	215495
Boron	NELAP	0.0250	S	**6.44**	mg/L	5	12/07/2023 13:39	215495
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/07/2023 13:39	215495
Calcium	NELAP	0.125	S	**91.9**	mg/L	5	12/07/2023 13:39	215495
Chromium	NELAP	0.0015	S	**< 0.0015**	mg/L	5	12/08/2023 12:09	215495
Cobalt	NELAP	0.0010	S	**< 0.0010**	mg/L	5	12/12/2023 11:53	215495
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/07/2023 13:39	215495
Lithium	*	0.0030		**0.0343**	mg/L	5	12/07/2023 13:39	215495
Molybdenum	NELAP	0.0015		**0.192**	mg/L	5	12/07/2023 13:39	215495
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/07/2023 13:39	215495
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/07/2023 13:39	215495
Matrix spike did not recover within control limits due to sample composition.								
Matrix spike control limits are not applicable due to high sample/spike ratio.								
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:45	215460
Arsenic	NELAP	0.0010		**0.0031**	mg/L	5	12/05/2023 22:53	215460
Barium	NELAP	0.0010		**0.158**	mg/L	5	12/05/2023 22:53	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:53	215460
Boron	NELAP	0.0250		**6.77**	mg/L	5	12/05/2023 22:53	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:53	215460
Calcium	NELAP	0.125		**134**	mg/L	5	12/12/2023 10:39	215460
Chromium	NELAP	0.0015		**0.0023**	mg/L	5	12/12/2023 10:39	215460
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/12/2023 10:39	215460
Lead	NELAP	0.0010		**0.0014**	mg/L	5	12/05/2023 22:53	215460
Lithium	*	0.0030		**0.0371**	mg/L	5	12/05/2023 22:53	215460
Molybdenum	NELAP	0.0015		**0.215**	mg/L	5	12/07/2023 15:05	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/12/2023 10:39	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:53	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:47	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-014 **Client Sample ID:** DUP-02-WG-20231129

Matrix: GROUNDWATER **Collection Date:** 11/29/2023 0:02

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**376**	mg/L	1	11/30/2023 10:41	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**35**	mg/L	1	12/01/2023 23:34	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**7.45**		1	11/30/2023 15:46	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**0.21**	mg/L	1	11/30/2023 11:06	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**12**	mg/L	1	12/01/2023 23:34	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 9:56	215495
Arsenic	NELAP	0.0010		**0.0020**	mg/L	5	12/05/2023 19:48	215495
Barium	NELAP	0.0010		**0.108**	mg/L	5	12/05/2023 19:48	215495
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:48	215495
Boron	NELAP	0.0250		**0.166**	mg/L	5	12/05/2023 19:48	215495
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:48	215495
Calcium	NELAP	0.125		**73.6**	mg/L	5	12/07/2023 12:57	215495
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/05/2023 19:48	215495
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:48	215495
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:48	215495
Lithium	*	0.0030		**0.0120**	mg/L	5	12/05/2023 19:48	215495
Molybdenum	NELAP	0.0015		**0.0146**	mg/L	5	12/07/2023 12:57	215495
Selenium	NELAP	0.0010		**0.0159**	mg/L	5	12/05/2023 19:48	215495
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 19:48	215495
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:49	215460
Arsenic	NELAP	0.0010		**0.0028**	mg/L	5	12/05/2023 22:59	215460
Barium	NELAP	0.0010		**0.143**	mg/L	5	12/05/2023 22:59	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:59	215460
Boron	NELAP	0.0250		**0.221**	mg/L	5	12/05/2023 22:59	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:59	215460
Calcium	NELAP	0.125		**111**	mg/L	5	12/12/2023 10:43	215460
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/12/2023 10:43	215460
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/12/2023 10:43	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 22:59	215460
Lithium	*	0.0030		**0.0163**	mg/L	5	12/05/2023 22:59	215460
Molybdenum	NELAP	0.0015		**0.0171**	mg/L	5	12/07/2023 16:43	215460
Selenium	NELAP	0.0010		**0.0194**	mg/L	5	12/07/2023 16:43	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 22:59	215460
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:49	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Lab ID: 23112078-015 **Client Sample ID:** EB-01-WQ-20231127

Matrix: GROUNDWATER **Collection Date:** 11/27/2023 11:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
STANDARD METHODS 2540 C (TOTAL) 1997, 2011								
Total Dissolved Solids	NELAP	20		**< 20**	mg/L	1	11/30/2023 10:30	R339971
SW-846 9036 (TOTAL)								
Sulfate	NELAP	10		**< 10**	mg/L	1	12/01/2023 23:42	R340009
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00	H	**5.15**		1	11/30/2023 15:52	R339913
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		**< 0.10**	mg/L	1	11/30/2023 11:09	R339841
SW-846 9251 (TOTAL)								
Chloride	NELAP	4		**< 4**	mg/L	1	12/01/2023 23:42	R340022
SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)								
Antimony	NELAP	0.0010		**0.0012**	mg/L	5	12/11/2023 10:25	215495
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	12/05/2023 19:54	215495
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Calcium	NELAP	0.125		**< 0.125**	mg/L	5	12/07/2023 13:03	215495
Chromium	NELAP	0.0015		**< 0.0015**	mg/L	5	12/05/2023 19:54	215495
Cobalt	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Lithium	*	0.0030		**< 0.0030**	mg/L	5	12/05/2023 19:54	215495
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/07/2023 13:03	215495
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/05/2023 19:54	215495
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/05/2023 19:54	215495
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)								
Antimony	NELAP	0.0010		**< 0.0010**	mg/L	5	12/11/2023 11:53	215460
Arsenic	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 0:19	215460
Barium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 0:19	215460
Beryllium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 0:19	215460
Boron	NELAP	0.0250		**< 0.0250**	mg/L	5	12/06/2023 0:19	215460
Cadmium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 0:19	215460
Calcium	NELAP	0.125	SR	**< 0.125**	mg/L	5	12/12/2023 10:58	215460
Chromium	NELAP	0.0015	SR	**< 0.0015**	mg/L	5	12/12/2023 10:58	215460
Cobalt	NELAP	0.0010	SR	**< 0.0010**	mg/L	5	12/12/2023 10:58	215460
Lead	NELAP	0.0010		**< 0.0010**	mg/L	5	12/06/2023 0:19	215460
Lithium	*	0.0030		**< 0.0030**	mg/L	5	12/06/2023 0:19	215460
Molybdenum	NELAP	0.0015		**< 0.0015**	mg/L	5	12/07/2023 16:49	215460
Selenium	NELAP	0.0010		**< 0.0010**	mg/L	5	12/07/2023 16:49	215460
Thallium	NELAP	0.0020		**< 0.0020**	mg/L	5	12/06/2023 0:19	215460

RPD for MS/MSD was outside control limits.

Matrix spike recovered outside upper control limits. Sample results are below the reporting limit. Data is reportable.

SW-846 7470A (TOTAL)								
Mercury	NELAP	0.00020		**< 0.00020**	mg/L	1	12/06/2023 12:51	215503
EPA 903.0/904.0, RADIUM 226/228								
Radium-226	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236
Radium-228	*	0		**See Attached**	pci/L	1	12/21/2023 14:33	R341236

Client: ERM
Client Project: 0599247

Work Order: 23112078
Report Date: 02-Jan-24

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
23112078-001	APW-03-WG-20231127	Groundwater	4	11/27/2023 14:10
23112078-002	APW-10D-WG-20231127	Groundwater	4	11/27/2023 15:30
23112078-003	APW-10S-WG-20231127	Groundwater	4	11/27/2023 16:35
23112078-004	APW-06S-WG-20231128	Groundwater	4	11/28/2023 9:00
23112078-005	APW-06D-WG-20231128	Groundwater	4	11/28/2023 10:35
23112078-006	APW-05R-WG-20231128	Groundwater	4	11/28/2023 12:05
23112078-007	APW-02-WG-20231128	Groundwater	4	11/28/2023 13:20
23112078-008	APW-07-WG-20231128	Groundwater	4	11/28/2023 15:10
23112078-009	APW-08-WG-20231128	Groundwater	4	11/28/2023 16:30
23112078-010	APW-04-WG-20231129	Groundwater	4	11/29/2023 8:30
23112078-011	APW-01R-WG-20231129	Groundwater	4	11/29/2023 10:00
23112078-012	APW-09-WG-20231129	Groundwater	4	11/29/2023 11:30
23112078-013	DUP-01-WG-20231128	Groundwater	4	11/28/2023 0:01
23112078-014	DUP-02-WG-20231129	Groundwater	4	11/29/2023 0:02
23112078-015	EB-01-WQ-20231127	Groundwater	4	11/27/2023 11:00

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23112078-001A	APW-03-WG-20231127	11/27/2023 14:10	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:29
	SW-846 9036 (Total)				12/01/2023 20:46
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:19
	SW-846 9214 (Total)				11/30/2023 10:13
	SW-846 9251 (Total)				12/01/2023 20:36
23112078-001B	APW-03-WG-20231127	11/27/2023 14:10	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-001C	APW-03-WG-20231127	11/27/2023 14:10	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 21:02
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 13:09
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 12:03
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:29
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:09
23112078-001D	APW-03-WG-20231127	11/27/2023 14:10	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/05/2023 19:36
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/07/2023 11:49
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/08/2023 11:38
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/11/2023 9:48
23112078-002A	APW-10D-WG-20231127	11/27/2023 15:30	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:29
	SW-846 9036 (Total)				12/01/2023 20:57
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:21
	SW-846 9214 (Total)				11/30/2023 10:16
	SW-846 9251 (Total)				12/01/2023 20:57
23112078-002B	APW-10D-WG-20231127	11/27/2023 15:30	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-002C	APW-10D-WG-20231127	11/27/2023 15:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 21:08
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 13:15
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 12:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:33
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:11
23112078-002D	APW-10D-WG-20231127	11/27/2023 15:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 18:20
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 11:51
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 9:58

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23112078-003A	APW-10S-WG-20231127	11/27/2023 16:35	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:30
	SW-846 9036 (Total)				12/01/2023 21:22
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:22
	SW-846 9214 (Total)				11/30/2023 10:19
	SW-846 9251 (Total)				12/01/2023 21:21
23112078-003B	APW-10S-WG-20231127	11/27/2023 16:35	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-003C	APW-10S-WG-20231127	11/27/2023 16:35	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 21:33
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 15:11
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 13:36
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:35
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:13
23112078-003D	APW-10S-WG-20231127	11/27/2023 16:35	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 18:26
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 11:57
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:04
23112078-004A	APW-06S-WG-20231128	11/28/2023 9:00	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:30
	SW-846 9036 (Total)				12/01/2023 21:34
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:24
	SW-846 9214 (Total)				11/30/2023 10:22
	SW-846 9251 (Total)				12/01/2023 21:29
23112078-004B	APW-06S-WG-20231128	11/28/2023 9:00	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-004C	APW-06S-WG-20231128	11/28/2023 9:00	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 21:14
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 13:21
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 12:59
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:37
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:00
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:16
23112078-004D	APW-06S-WG-20231128	11/28/2023 9:00	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 18:32
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 12:02

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:10
23112078-005A	APW-06D-WG-20231128	11/28/2023 10:35	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:31
	SW-846 9036 (Total)				12/01/2023 21:42
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:26
	SW-846 9214 (Total)				11/30/2023 10:24
	SW-846 9251 (Total)				12/01/2023 21:37
23112078-005B	APW-06D-WG-20231128	11/28/2023 10:35	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-005C	APW-06D-WG-20231128	11/28/2023 10:35	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 21:21
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 13:27
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 13:06
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:41
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:05
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:18
23112078-005D	APW-06D-WG-20231128	11/28/2023 10:35	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 18:38
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 12:07
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:16
23112078-006A	APW-05R-WG-20231128	11/28/2023 12:05	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:31
	SW-846 9036 (Total)				12/01/2023 21:50
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:27
	SW-846 9214 (Total)				11/30/2023 10:35
	SW-846 9251 (Total)				12/01/2023 21:45
23112078-006B	APW-05R-WG-20231128	11/28/2023 12:05	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-006C	APW-05R-WG-20231128	11/28/2023 12:05	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 21:27
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 13:33
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 13:12
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:45
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:10
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:20
23112078-006D	APW-05R-WG-20231128	11/28/2023 12:05	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 18:44

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 12:12
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:22
23112078-007A	APW-02-WG-20231128	11/28/2023 13:20	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:31
	SW-846 9036 (Total)				12/01/2023 21:58
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:29
	SW-846 9214 (Total)				11/30/2023 10:37
	SW-846 9251 (Total)				12/01/2023 21:53
23112078-007B	APW-02-WG-20231128	11/28/2023 13:20	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-007C	APW-02-WG-20231128	11/28/2023 13:20	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:16
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 14:28
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 13:18
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 10:49
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:15
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:22
23112078-007D	APW-02-WG-20231128	11/28/2023 13:20	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 20:03
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 13:36
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 12:08
23112078-008A	APW-07-WG-20231128	11/28/2023 15:10	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:32
	SW-846 9036 (Total)				12/01/2023 22:17
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:32
	SW-846 9214 (Total)				11/30/2023 10:40
	SW-846 9251 (Total)				12/01/2023 22:17
23112078-008B	APW-07-WG-20231128	11/28/2023 15:10	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-008C	APW-07-WG-20231128	11/28/2023 15:10	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:22
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 14:34
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 13:24
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:24
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:20
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:35
23112078-008D	APW-07-WG-20231128	11/28/2023 15:10	11/29/2023 14:30		

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 19:33
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 12:17
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:28
23112078-009A	APW-08-WG-20231128	11/28/2023 16:30	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:32
	SW-846 9036 (Total)				12/01/2023 22:25
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:34
	SW-846 9214 (Total)				11/30/2023 10:43
	SW-846 9251 (Total)				12/01/2023 22:25
23112078-009B	APW-08-WG-20231128	11/28/2023 16:30	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-009C	APW-08-WG-20231128	11/28/2023 16:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:28
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 14:41
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 13:30
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:28
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:25
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:38
23112078-009D	APW-08-WG-20231128	11/28/2023 16:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 19:39
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 13:20
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:34
23112078-010A	APW-04-WG-20231129	11/29/2023 8:30	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:40
	SW-846 9036 (Total)				12/05/2023 12:03
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:36
	SW-846 9214 (Total)				11/30/2023 10:45
	SW-846 9251 (Total)				12/01/2023 22:36
23112078-010B	APW-04-WG-20231129	11/29/2023 8:30	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-010C	APW-04-WG-20231129	11/29/2023 8:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:35
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 14:47
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 14:45
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:33
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 9:30
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:40

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
23112078-010D	APW-04-WG-20231129	11/29/2023 8:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 19:45
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 13:25
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 10:41
23112078-011A	APW-01R-WG-20231129	11/29/2023 10:00	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:41
	SW-846 9036 (Total)				12/05/2023 12:40
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:41
	SW-846 9214 (Total)				11/30/2023 10:47
	SW-846 9251 (Total)				12/01/2023 23:10
23112078-011B	APW-01R-WG-20231129	11/29/2023 10:00	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-011C	APW-01R-WG-20231129	11/29/2023 10:00	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:41
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 14:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 14:51
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:37
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 10:29
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:42
23112078-011D	APW-01R-WG-20231129	11/29/2023 10:00	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/04/2023 19:51
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/06/2023 13:31
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/01/2023 8:52	12/07/2023 12:01
23112078-012A	APW-09-WG-20231129	11/29/2023 11:30	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				12/01/2023 10:01
	SW-846 9036 (Total)				12/01/2023 23:18
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:43
	SW-846 9214 (Total)				11/30/2023 10:50
	SW-846 9251 (Total)				12/01/2023 23:18
23112078-012B	APW-09-WG-20231129	11/29/2023 11:30	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-012C	APW-09-WG-20231129	11/29/2023 11:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:47
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 14:59
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 14:57
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:41
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 10:34

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:45
23112078-012D	APW-09-WG-20231129	11/29/2023 11:30	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/05/2023 19:42
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/07/2023 11:55
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/08/2023 11:45
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/11/2023 9:52
23112078-013A	DUP-01-WG-20231128	11/28/2023 0:01	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:40
	SW-846 9036 (Total)				12/01/2023 23:32
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:45
	SW-846 9214 (Total)				11/30/2023 10:52
	SW-846 9251 (Total)				12/01/2023 23:26
23112078-013B	DUP-01-WG-20231128	11/28/2023 0:01	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-013C	DUP-01-WG-20231128	11/28/2023 0:01	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 15:05
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 15:04
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:45
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 10:39
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:47
23112078-013D	DUP-01-WG-20231128	11/28/2023 0:01	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/07/2023 13:39
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/08/2023 12:09
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/11/2023 10:00
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/12/2023 11:53
23112078-014A	DUP-02-WG-20231129	11/29/2023 0:02	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:41
	SW-846 9036 (Total)				12/01/2023 23:34
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:46
	SW-846 9214 (Total)				11/30/2023 11:06
	SW-846 9251 (Total)				12/01/2023 23:34
23112078-014B	DUP-02-WG-20231129	11/29/2023 0:02	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-014C	DUP-02-WG-20231129	11/29/2023 0:02	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/05/2023 22:59
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 16:43

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 15:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:49
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 10:43
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:49
23112078-014D	DUP-02-WG-20231129	11/29/2023 0:02	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/05/2023 19:48
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/07/2023 12:57
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/11/2023 9:56
23112078-015A	EB-01-WQ-20231127	11/27/2023 11:00	11/29/2023 14:30		
	Standard Methods 2540 C (Total) 1997, 2011				11/30/2023 10:30
	SW-846 9036 (Total)				12/01/2023 23:42
	SW-846 9040B, Laboratory Analyzed				11/30/2023 15:52
	SW-846 9214 (Total)				11/30/2023 11:09
	SW-846 9251 (Total)				12/01/2023 23:42
23112078-015B	EB-01-WQ-20231127	11/27/2023 11:00	11/29/2023 14:30		
	EPA 903.0/904.0, Radium 226/228				12/21/2023 14:33
23112078-015C	EB-01-WQ-20231127	11/27/2023 11:00	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/06/2023 0:19
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/07/2023 16:49
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/08/2023 15:10
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/11/2023 11:53
	SW-846 3005A, 6020A, Metals by ICPMS (Total)			12/04/2023 10:16	12/12/2023 10:58
	SW-846 7470A (Total)			12/05/2023 8:14	12/06/2023 12:51
23112078-015D	EB-01-WQ-20231127	11/27/2023 11:00	11/29/2023 14:30		
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/05/2023 19:54
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/07/2023 13:03
	SW-846 3005A, 6020A, Metals by ICPMS (Dissolved)			12/04/2023 17:50	12/11/2023 10:25

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

STANDARD METHODS 2540 C (TOTAL) 1997, 2011

Batch R339971 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**< 20**	16.00	0	0	-100	100	11/30/2023

Batch R339971 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids		20		**990**	1000	0	99.0	90	110	11/30/2023

Batch R339971 **SampType:** DUP Units **mg/L** RPD Limit **10**
SampID: 23112078-012ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids		20		**350**				380.0	8.22	12/01/2023

SW-846 9036 (TOTAL)

Batch R340009 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	12/01/2023

Batch R340009 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	95.5	90	110	12/01/2023

Batch R340009 **SampType:** MS Units **mg/L**
SampID: 23112078-001AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		100		**316**	200.0	133.3	91.2	85	115	12/01/2023

Batch R340009 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 23112078-001AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		100		**319**	200.0	133.3	92.9	315.7	1.06	12/01/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 9036 (TOTAL)

Batch R340126 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**< 10**	6.140	0	0	-100	100	12/05/2023

Batch R340126 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		**19**	20.00	0	95.0	90	110	12/05/2023

Batch R340126 **SampType:** MS Units **mg/L**
SampID: 23112078-010AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		20		**92**	40.00	53.68	94.8	85	115	12/05/2023

Batch R340126 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 23112078-010AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		20		**92**	40.00	53.68	96.7	91.58	0.84	12/05/2023

SW-846 9040B, LABORATORY ANALYZED

Batch R339913 **SampType:** LCS Units
SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		**6.97**	7.000	0	99.6	99.29	100.7	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**
SampID: 23112078-001ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.20**				7.240	0.55	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**
SampID: 23112078-002ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.07**				7.080	0.14	11/30/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 9040B, LABORATORY ANALYZED

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-003ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.03**				7.010	0.28	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-004ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.14**				7.120	0.28	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-005ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.38**				7.360	0.27	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-006ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.32**				7.330	0.14	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-007ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.13**				7.110	0.28	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-008ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.85**				6.860	0.15	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-009ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.32**				7.270	0.69	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-010ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.33**				7.310	0.27	11/30/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 9040B, LABORATORY ANALYZED

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-011ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**6.58**				6.590	0.15	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-012ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.51**				7.500	0.13	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-013ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.33**				7.340	0.14	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-014ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**7.45**				7.450	0.00	11/30/2023

Batch R339913 **SampType:** DUP Units RPD Limit **10**

SampID: 23112078-015ADUP

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH		1.00	H	**5.16**				5.150	0.19	11/30/2023

SW-846 9214 (TOTAL)

Batch R339841 **SampType:** MBLK Units **mg/L**

SampID: MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**< 0.10**	0.0500	0	0	-100	100	11/29/2023

Batch R339841 **SampType:** LCS Units **mg/L**

SampID: LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**1.00**	1.000	0	99.5	90	110	11/29/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 9214 (TOTAL)

Batch R339841 **SampType:** MS Units **mg/L**
SampID: 23112078-005AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.31**	2.000	0.2400	103.6	75	125	11/30/2023

Batch R339841 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23112078-005AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.38**	2.000	0.2400	107.2	2.311	3.11	11/30/2023

Batch R339841 **SampType:** MS Units **mg/L**
SampID: 23112078-013AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Fluoride		0.10		**2.50**	2.000	0.3540	107.4	75	125	11/30/2023

Batch R339841 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23112078-013AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Fluoride		0.10		**2.41**	2.000	0.3540	102.7	2.501	3.79	11/30/2023

SW-846 9251 (TOTAL)

Batch R340022 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	12/01/2023

Batch R340022 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**20**	20.00	0	101.0	90	110	12/01/2023

Batch R340022 **SampType:** MS Units **mg/L**
SampID: 23112078-001AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**30**	20.00	11.15	93.3	85	115	12/01/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 9251 (TOTAL)

Batch R340022 **SampType:** MSD Units **mg/L** RPD Limit **15**

SampID: 23112078-001AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		4		**30**	20.00	11.15	93.4	29.80	0.07	12/01/2023

Batch R340022 **SampType:** MS Units **mg/L**

SampID: 23112078-010AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**30**	20.00	10.55	95.6	85	115	12/01/2023

Batch R340022 **SampType:** MSD Units **mg/L** RPD Limit **15**

SampID: 23112078-010AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Chloride		4		**30**	20.00	10.55	94.8	29.66	0.54	12/01/2023

Batch R340139 **SampType:** MBLK Units **mg/L**

SampID: ICB/MBLK

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**< 4**	0.5000	0	0	-100	100	12/05/2023

Batch R340139 **SampType:** LCS Units **mg/L**

SampID: ICV/LCS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Chloride		4		**21**	20.00	0	102.9	90	110	12/05/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 215379 **SampType:** MBLK Units **mg/L**

SampID: MBLK-215379

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	12/06/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	12/04/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	12/04/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	12/04/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	12/04/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	12/04/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	12/05/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	12/04/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	12/04/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	12/04/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	12/04/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	12/04/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	12/04/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	12/04/2023

Batch 215379 **SampType:** LCS Units **mg/L**

SampID: LCS-215379

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.438**	0.5000	0	87.6	80	120	12/06/2023
Arsenic		0.0010		**0.486**	0.5000	0	97.1	80	120	12/04/2023
Barium		0.0010		**1.89**	2.000	0	94.7	80	120	12/04/2023
Beryllium		0.0010		**0.0474**	0.0500	0	94.9	80	120	12/04/2023
Boron		0.0250		**0.456**	0.5000	0	91.3	80	120	12/04/2023
Cadmium		0.0010		**0.0466**	0.0500	0	93.1	80	120	12/04/2023
Calcium		0.125		**2.34**	2.500	0	93.8	80	120	12/07/2023
Chromium		0.0015		**0.188**	0.2000	0	93.8	80	120	12/04/2023
Cobalt		0.0010		**0.469**	0.5000	0	93.7	80	120	12/04/2023
Lead		0.0010		**0.487**	0.5000	0	97.4	80	120	12/04/2023
Lithium	*	0.0030		**0.476**	0.5000	0	95.2	80	120	12/04/2023
Molybdenum		0.0015		**0.441**	0.5000	0	88.3	80	120	12/04/2023
Selenium		0.0010		**0.471**	0.5000	0	94.3	80	120	12/04/2023
Thallium		0.0020		**0.233**	0.2500	0	93.3	80	120	12/04/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 215379 **SampType:** MS Units **mg/L**

SampID: 23112078-007DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.509**	0.5000	0	101.8	75	125	12/06/2023
Arsenic		0.0010		**0.504**	0.5000	0.01677	97.5	75	125	12/04/2023
Barium		0.0010		**2.04**	2.000	0.2048	91.6	75	125	12/04/2023
Beryllium		0.0010		**0.0470**	0.0500	0	93.9	75	125	12/04/2023
Boron		0.0250	S	**7.39**	0.5000	9.565	-435.1	75	125	12/04/2023
Cadmium		0.0010		**0.0459**	0.0500	0	91.7	75	125	12/04/2023
Calcium		0.125	S	**136**	2.500	121.4	570.3	75	125	12/07/2023
Chromium		0.0015		**0.185**	0.2000	0	92.6	75	125	12/04/2023
Cobalt		0.0010		**0.459**	0.5000	0.0001408	91.8	75	125	12/04/2023
Lead		0.0010		**0.461**	0.5000	0	92.2	75	125	12/04/2023
Lithium	*	0.0030		**0.502**	0.5000	0.05065	90.2	75	125	12/04/2023
Molybdenum		0.0015		**0.621**	0.5000	0.2053	83.1	75	125	12/04/2023
Selenium		0.0010		**0.464**	0.5000	0	92.8	75	125	12/04/2023
Thallium		0.0020		**0.222**	0.2500	0	88.9	75	125	12/04/2023

Batch 215379 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23112078-007DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.474**	0.5000	0	94.7	0.5091	7.22	12/06/2023
Arsenic		0.0010		**0.508**	0.5000	0.01677	98.3	0.5043	0.77	12/04/2023
Barium		0.0010		**2.04**	2.000	0.2048	91.9	2.037	0.26	12/04/2023
Beryllium		0.0010		**0.0472**	0.0500	0	94.3	0.04696	0.46	12/04/2023
Boron		0.0250	S	**7.48**	0.5000	9.565	-417.3	7.390	1.20	12/04/2023
Cadmium		0.0010		**0.0462**	0.0500	0	92.4	0.04587	0.76	12/04/2023
Calcium		0.125	S	**133**	2.500	121.4	467.7	135.6	1.91	12/07/2023
Chromium		0.0015		**0.183**	0.2000	0	91.6	0.1853	1.14	12/04/2023
Cobalt		0.0010		**0.455**	0.5000	0.0001408	91.0	0.4591	0.85	12/04/2023
Lead		0.0010		**0.462**	0.5000	0	92.4	0.4610	0.27	12/04/2023
Lithium	*	0.0030		**0.509**	0.5000	0.05065	91.7	0.5018	1.50	12/04/2023
Molybdenum		0.0015		**0.630**	0.5000	0.2053	84.9	0.6207	1.46	12/04/2023
Selenium		0.0010		**0.469**	0.5000	0	93.8	0.4641	1.01	12/04/2023
Thallium		0.0020		**0.227**	0.2500	0	90.8	0.2224	2.08	12/04/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 215495 **SampType:** MBLK Units **mg/L**

SampID: MBLK-215495

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	12/11/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	12/05/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	12/05/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	12/05/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	12/05/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	12/05/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	12/07/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	12/07/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	12/05/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	12/05/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	12/05/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	12/07/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	12/05/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	12/05/2023

Batch 215495 **SampType:** LCS Units **mg/L**

SampID: LCS-215495

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.504**	0.5000	0	100.8	80	120	12/11/2023
Arsenic		0.0010		**0.500**	0.5000	0	99.9	80	120	12/05/2023
Barium		0.0010		**1.93**	2.000	0	96.7	80	120	12/05/2023
Beryllium		0.0010		**0.0435**	0.0500	0	86.9	80	120	12/05/2023
Boron		0.0250		**0.411**	0.5000	0	82.3	80	120	12/05/2023
Cadmium		0.0010		**0.0458**	0.0500	0	91.6	80	120	12/05/2023
Calcium		0.125		**2.03**	2.500	0	81.1	80	120	12/07/2023
Chromium		0.0015		**0.180**	0.2000	0	90.0	80	120	12/08/2023
Cobalt		0.0010		**0.454**	0.5000	0	90.8	80	120	12/05/2023
Lead		0.0010		**0.475**	0.5000	0	95.1	80	120	12/05/2023
Lithium	*	0.0030		**0.430**	0.5000	0	86.0	80	120	12/05/2023
Molybdenum		0.0015		**0.425**	0.5000	0	85.1	80	120	12/07/2023
Selenium		0.0010		**0.471**	0.5000	0	94.2	80	120	12/05/2023
Thallium		0.0020		**0.231**	0.2500	0	92.2	80	120	12/05/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (DISSOLVED)

Batch 215495 **SampType:** MS Units **mg/L**

SampID: 23112078-013DMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010	S	**< 0.0010**	0.5000	0	0	75	125	12/11/2023
Arsenic		0.0010		**0.487**	0.5000	0.001777	97.1	75	125	12/07/2023
Barium		0.0010		**2.01**	2.000	0.1265	94.1	75	125	12/07/2023
Beryllium		0.0010		**0.0487**	0.0500	0	97.4	75	125	12/07/2023
Boron		0.0250	S	**7.30**	0.5000	6.439	172.8	75	125	12/07/2023
Cadmium		0.0010		**0.0479**	0.0500	0	95.8	75	125	12/07/2023
Calcium		0.125	S	**100**	2.500	91.91	331.8	75	125	12/07/2023
Chromium		0.0015	S	**< 0.0015**	0.2000	0.0007115	-0.4	75	125	12/08/2023
Cobalt		0.0010	S	**< 0.0010**	0.5000	0	0	75	125	12/12/2023
Lead		0.0010		**0.486**	0.5000	0	97.1	75	125	12/07/2023
Lithium	*	0.0030		**0.549**	0.5000	0.03434	103.0	75	125	12/07/2023
Molybdenum		0.0015		**0.686**	0.5000	0.1916	98.9	75	125	12/07/2023
Selenium		0.0010		**0.481**	0.5000	0	96.3	75	125	12/07/2023
Thallium		0.0020		**0.237**	0.2500	0	94.9	75	125	12/07/2023

Batch 215495 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23112078-013DMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010	S	**< 0.0010**	0.5000	0	0	0	0.00	12/11/2023
Arsenic		0.0010		**0.486**	0.5000	0.001777	96.9	0.4873	0.17	12/07/2023
Barium		0.0010		**1.97**	2.000	0.1265	92.4	2.008	1.71	12/07/2023
Beryllium		0.0010		**0.0473**	0.0500	0	94.7	0.04869	2.83	12/07/2023
Boron		0.0250	S	**7.24**	0.5000	6.439	160.2	7.304	0.87	12/07/2023
Cadmium		0.0010		**0.0469**	0.0500	0	93.7	0.04792	2.24	12/07/2023
Calcium		0.125	S	**99.5**	2.500	91.91	301.9	100.2	0.75	12/07/2023
Chromium		0.0015	S	**< 0.0015**	0.2000	0.0007115	-0.4	0	0.00	12/08/2023
Cobalt		0.0010	S	**< 0.0010**	0.5000	0	0	0	0.00	12/12/2023
Lead		0.0010		**0.474**	0.5000	0	94.8	0.4856	2.39	12/07/2023
Lithium	*	0.0030		**0.545**	0.5000	0.03434	102.2	0.5495	0.80	12/07/2023
Molybdenum		0.0015		**0.670**	0.5000	0.1916	95.6	0.6861	2.40	12/07/2023
Selenium		0.0010		**0.476**	0.5000	0	95.2	0.4814	1.13	12/07/2023
Thallium		0.0020		**0.229**	0.2500	0	91.8	0.2372	3.36	12/07/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 215460 **SampType:** MBLK Units **mg/L**

SampID: MBLK-215460

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**< 0.0010**	0.0004	0	0	-100	100	12/11/2023
Arsenic		0.0010		**< 0.0010**	0.0004	0	0	-100	100	12/05/2023
Barium		0.0010		**< 0.0010**	0.0007	0	0	-100	100	12/05/2023
Beryllium		0.0010		**< 0.0010**	0.0002	0	0	-100	100	12/05/2023
Boron		0.0250		**< 0.0250**	0.0093	0	0	-100	100	12/05/2023
Cadmium		0.0010		**< 0.0010**	0.0001	0	0	-100	100	12/05/2023
Calcium		0.125		**< 0.125**	0.0700	0	0	-100	100	12/07/2023
Chromium		0.0015		**< 0.0015**	0.0007	0	0	-100	100	12/07/2023
Cobalt		0.0010		**< 0.0010**	0.0001	0	0	-100	100	12/05/2023
Lead		0.0010		**< 0.0010**	0.0006	0	0	-100	100	12/05/2023
Lithium	*	0.0030		**< 0.0030**	0.0015	0	0	-100	100	12/05/2023
Molybdenum		0.0015		**< 0.0015**	0.0006	0	0	-100	100	12/07/2023
Selenium		0.0010		**< 0.0010**	0.0006	0	0	-100	100	12/05/2023
Thallium		0.0020		**< 0.0020**	0.0010	0	0	-100	100	12/05/2023

Batch 215460 **SampType:** LCS Units **mg/L**

SampID: LCS-215460

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.596**	0.5000	0	119.3	80	120	12/11/2023
Arsenic		0.0010		**0.554**	0.5000	0	110.7	80	120	12/05/2023
Barium		0.0010		**2.12**	2.000	0	106.0	80	120	12/05/2023
Beryllium		0.0010		**0.0520**	0.0500	0	103.9	80	120	12/05/2023
Boron		0.0250		**0.495**	0.5000	0	99.0	80	120	12/05/2023
Cadmium		0.0010		**0.0519**	0.0500	0	103.7	80	120	12/05/2023
Calcium		0.125		**2.33**	2.500	0	93.3	80	120	12/07/2023
Chromium		0.0015		**0.198**	0.2000	0	99.0	80	120	12/08/2023
Cobalt		0.0010		**0.507**	0.5000	0	101.4	80	120	12/05/2023
Lead		0.0010		**0.547**	0.5000	0	109.3	80	120	12/05/2023
Lithium	*	0.0030		**0.525**	0.5000	0	104.9	80	120	12/05/2023
Molybdenum		0.0015		**0.480**	0.5000	0	95.9	80	120	12/07/2023
Selenium		0.0010		**0.519**	0.5000	0	103.8	80	120	12/05/2023
Thallium		0.0020		**0.256**	0.2500	0	102.5	80	120	12/05/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 215460 **SampType:** MS Units **mg/L**

SampID: 23112078-003CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.568**	0.5000	0	113.6	75	125	12/11/2023
Arsenic		0.0010		**0.746**	0.5000	0.2757	94.0	75	125	12/05/2023
Barium		0.0010		**2.98**	2.000	0.8042	109.0	75	125	12/05/2023
Beryllium		0.0010		**0.0508**	0.0500	0	101.6	75	125	12/05/2023
Boron		0.0250		**1.09**	0.5000	0.5548	107.3	75	125	12/07/2023
Cadmium		0.0010		**0.0512**	0.0500	0	102.4	75	125	12/05/2023
Calcium		0.125	S	**139**	2.500	128.5	431.9	75	125	12/07/2023
Chromium		0.0015		**0.233**	0.2000	0.001607	115.8	75	125	12/12/2023
Cobalt		0.0010		**0.484**	0.5000	0.001319	96.5	75	125	12/05/2023
Lead		0.0010		**0.511**	0.5000	0	102.3	75	125	12/05/2023
Lithium	*	0.0030		**0.516**	0.5000	0.04008	95.1	75	125	12/05/2023
Molybdenum		0.0015		**0.499**	0.5000	0.002064	99.4	75	125	12/07/2023
Selenium		0.0010		**0.509**	0.5000	0	101.8	75	125	12/05/2023
Thallium		0.0020		**0.242**	0.2500	0	96.7	75	125	12/05/2023

Batch 215460 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23112078-003CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.607**	0.5000	0	121.4	0.5681	6.61	12/11/2023
Arsenic		0.0010		**0.747**	0.5000	0.2757	94.3	0.7455	0.23	12/05/2023
Barium		0.0010		**2.91**	2.000	0.8042	105.5	2.984	2.37	12/05/2023
Beryllium		0.0010		**0.0489**	0.0500	0	97.7	0.05081	3.88	12/05/2023
Boron		0.0250		**1.11**	0.5000	0.5548	110.6	1.091	1.49	12/07/2023
Cadmium		0.0010		**0.0501**	0.0500	0	100.1	0.05119	2.20	12/05/2023
Calcium		0.125	S	**149**	2.500	128.5	817.6	139.3	6.69	12/07/2023
Chromium		0.0015		**0.240**	0.2000	0.001607	119.1	0.2333	2.73	12/12/2023
Cobalt		0.0010		**0.476**	0.5000	0.001319	95.0	0.4838	1.54	12/05/2023
Lead		0.0010		**0.507**	0.5000	0	101.3	0.5115	0.96	12/05/2023
Lithium	*	0.0030		**0.509**	0.5000	0.04008	93.8	0.5158	1.33	12/05/2023
Molybdenum		0.0015		**0.504**	0.5000	0.002064	100.3	0.4993	0.86	12/07/2023
Selenium		0.0010		**0.498**	0.5000	0	99.6	0.5090	2.15	12/05/2023
Thallium		0.0020		**0.238**	0.2500	0	95.3	0.2416	1.37	12/05/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)

Batch 215460 **SampType:** MS Units **mg/L**

SampID: 23112078-015CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Antimony		0.0010		**0.571**	0.5000	0	114.1	75	125	12/11/2023
Arsenic		0.0010		**0.542**	0.5000	0	108.3	75	125	12/06/2023
Barium		0.0010		**2.14**	2.000	0	107.2	75	125	12/06/2023
Beryllium		0.0010		**0.0483**	0.0500	0	96.5	75	125	12/06/2023
Boron		0.0250		**0.460**	0.5000	0	92.0	75	125	12/06/2023
Cadmium		0.0010		**0.0515**	0.0500	0	103.1	75	125	12/06/2023
Calcium		0.125		**2.37**	2.500	0	94.8	75	125	12/12/2023
Chromium		0.0015		**0.203**	0.2000	0	101.5	75	125	12/12/2023
Cobalt		0.0010		**0.501**	0.5000	0	100.2	75	125	12/12/2023
Lead		0.0010		**0.535**	0.5000	0	106.9	75	125	12/06/2023
Lithium	*	0.0030		**0.485**	0.5000	0	97.0	75	125	12/06/2023
Molybdenum		0.0015		**0.476**	0.5000	0.0009545	95.0	75	125	12/07/2023
Selenium		0.0010		**0.511**	0.5000	0	102.2	75	125	12/07/2023
Thallium		0.0020		**0.247**	0.2500	0	98.6	75	125	12/06/2023

Batch 215460 **SampType:** MSD Units **mg/L** RPD Limit **20**

SampID: 23112078-015CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Antimony		0.0010		**0.572**	0.5000	0	114.4	0.5706	0.24	12/11/2023
Arsenic		0.0010		**0.522**	0.5000	0	104.3	0.5416	3.76	12/06/2023
Barium		0.0010		**2.02**	2.000	0	100.8	2.144	6.15	12/06/2023
Beryllium		0.0010		**0.0477**	0.0500	0	95.4	0.04826	1.23	12/06/2023
Boron		0.0250		**0.445**	0.5000	0	89.0	0.4602	3.40	12/06/2023
Cadmium		0.0010		**0.0497**	0.0500	0	99.4	0.05154	3.67	12/06/2023
Calcium		0.125	SR	**5.92**	2.500	0	236.7	2.371	85.58	12/12/2023
Chromium		0.0015	SR	**0.286**	0.2000	0	142.8	0.2031	33.79	12/12/2023
Cobalt		0.0010	SR	**0.708**	0.5000	0	141.6	0.5012	34.19	12/12/2023
Lead		0.0010		**0.505**	0.5000	0	100.9	0.5346	5.75	12/06/2023
Lithium	*	0.0030		**0.474**	0.5000	0	94.8	0.4851	2.32	12/06/2023
Molybdenum		0.0015		**0.484**	0.5000	0.0009545	96.5	0.4760	1.57	12/07/2023
Selenium		0.0010		**0.504**	0.5000	0	100.8	0.5109	1.40	12/07/2023
Thallium		0.0020		**0.238**	0.2500	0	95.1	0.2466	3.67	12/06/2023

Client: ERM **Work Order:** 23112078

Client Project: 0599247 **Report Date:** 02-Jan-24

SW-846 7470A (TOTAL)

Batch 215503 **SampType:** MBLK Units **mg/L**
SampID: MBLK-215503

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**< 0.00020**	0.0001	0	0	-100	100	12/06/2023

Batch 215503 **SampType:** LCS Units **mg/L**
SampID: LCS-215503

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00489**	0.0050	0	97.7	85	115	12/07/2023

Batch 215503 **SampType:** MS Units **mg/L**
SampID: 23112078-007CMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Mercury		0.00020		**0.00485**	0.0050	0	97.0	75	125	12/06/2023

Batch 215503 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 23112078-007CMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Mercury		0.00020		**0.00476**	0.0050	0	95.2	0.004851	1.90	12/06/2023

Receiving Check List

http://www.teklabinc.com/

Client: ERM
Client Project: 0599247

Work Order: 23112078
Report Date: 02-Jan-24

Carrier: Marshall Arendell

Received By: HAW

Completed by: Amber Dilallo
On: 29-Nov-23

Reviewed by: Ellie Hopkins
On: 29-Nov-23

Pages to follow: Chain of custody 2 Extra pages included 29

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C	3.0		
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐			
Chain of custody present?	Yes ☑	No ☐					
Chain of custody signed when relinquished and received?	Yes ☑	No ☐					
Chain of custody agrees with sample labels?	Yes ☑	No ☐					
Samples in proper container/bottle?	Yes ☑	No ☐					
Sample containers intact?	Yes ☑	No ☐					
Sufficient sample volume for indicated test?	Yes ☑	No ☐					
All samples received within holding time?	Yes ☐	No ☑					
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐				

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes ☑	No ☐					

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑				
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑				
Water - pH acceptable upon receipt?	Yes ☐	No ☑	NA ☐				
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑				

Any No responses must be detailed below or on the COC.

pH strip #90719. - HW/amberdilallo - 11/29/2023 4:12:46 PM

Additional Nitric Acid (94769) was needed in APW-10D-WG-20231127 and APW-10S-WG-20231127 upon arrival at the laboratory. - HW/amberdilallo - 11/29/2023 4:12:48 PM

EB-01-WQ-20231127 was filtered and preserved with Nitric Acid (94769) for the dissolved parameters upon arrival at the laboratory. - amberdilallo - 11/29/2023 4:12:51 PM

CHAIN OF CUSTODY

pg. 1 of 2 Work order # 23112078

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client:	ERM
Address:	1968 Craig Road
City / State / Zip	St. Louis, MO 63146
Contact:	Clay Sansoucie
Phone:	(314) 952-2760
E-Mail:	clay.sansoucie@erm.com
Fax:	

Samples on: ~~ICE~~ BLUE ICE NO ICE 3.0 °C LTG#

Preserved in: LAB FIELD

FOR LAB USE ONLY

Lab Notes PW90719. Added HNU3 (947609) to APW-10D-WG-20231127 and APW-10S-WG-20231127. HW 11/29

Are these samples known to be involved in litigation? If yes, a surcharge will apply ☐ Yes ☐ No

Are these samples known to be hazardous? If yes, include details of the hazard. ☐ Yes ☐ No

Are there any required reporting limits to be met on the requested analysis? If yes, please provide limits in the comment section. ☐ Yes ☐ No

Client Comments:

Total Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se Tl and Hg

Dissolved Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se and Tl

SUB Ra226/228 to Summit-OH.

Project Name/Number: 0599247

Sample Collector's Name: Marshall Hrenko / Nolan Legg

Results Requested: ☒ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other ☐ 3 Day (50% Surcharge)

Billing Instructions: 0599247

Lab Use Only	Sample Identification	Date/Time Sampled	# and Type of Containers: UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	MATRIX: Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	INDICATE ANALYSIS REQUESTED: Chloride	Dissolved Metals	Fluoride	pH	Ra226/228	Sulfate	TDS	Total Metals
23112078 001	APW-03-WG-20231127	11/27/23 1410	1	2		2										X	X	X	X	X	X	X	X	X
002	APW-10D-WG-20231127	11/27/23 1530	1	2		2																		
003	APW-10S-WG-20231127	11/27/23 1635	1	2		2																		
004	APW-06S-WG-20231129	11/28/23 0900	1	2		2																		
005	APW-06D-WG-20231128	11/28/23 1035	1	2		2																		
006	APW-05R-WG-20231128	11/28/23 1205	1	2		2																		
007	APW-02-WG-20231128	11/28/23 1320	1	2		2																		
008	APW-07-WG-20231128	11/28/23 1510	1	2		2																		
009	APW-08-WG-20231128	11/28/23 1630	1	2		2																		
010	APW-04-WG-20231129	11/29/23 0830	1	2		2																		

Relinquished By	Date/Time	Received By	Date/Time
	11/29/23 1430		11/29/23 1430

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 84755

HW 11/29

CHAIN OF CUSTODY

pg. 1 of 2 Work order # 23112078

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client:	ERM
Address:	1968 Craig Road
City / State / Zip	St. Louis, MO 63146
Contact:	Clay Sansoucie
Phone:	(314) 952-2760
E-Mail:	clay.sansoucie@erm.com
Fax:	

Samples on: ☒ ICE ☒ BLUE ICE ☒ NO ICE _____ °C LTG# _____

Preserved in: ☒ LAB ☒ FIELD

FOR LAB USE ONLY

Lab Notes

Are these samples known to be involved in litigation? If yes, a surcharge will apply ☐ Yes ☐ No

Are these samples known to be hazardous? If yes, include details of the hazard. ☐ Yes ☐ No

Are there any required reporting limits to be met on the requested analysis? If yes, please provide limits in the comment section. ☐ Yes ☐ No

Client Comments:

Total Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se Tl and Hg

Dissolved Metals: Sb As Ba Be B Cd Ca Cr Co Pb Li Mo Se and Tl

SUB Ra226/228 to Summit-OH.

Project Name/Number: 0599247

Sample Collector's Name: Marshall Arendell / Nolan Legg

Results Requested: ☒ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other ____ ☐ 3 Day (50% Surcharge)

Billing Instructions: 0599247

Lab Use Only	Sample Identification	Date/Time Sampled	# and Type of Containers: UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	MATRIX: Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	Chloride	Dissolved Metals	Fluoride	pH	Ra226/228	Sulfate	TDS	Total Metals
23112078-01	APW-01R-WG-20231129	11/29/23 1000	1	2		2										X	X	X	X	X	X	X	X	X
02	APW-04-WG-20231129	11/29/23 1130	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
03	DUP-01-WG-20231128	11/28/23 0001	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
04	DUP-02-WG-20231129	11/29/23 0002	1	2		2										↓	↓	↓	↓	↓	↓	↓	↓	↓
05	EB-01-WQ-20231127	11/27/23 1100	1	1		2										↓	↓	↓	↓	↓	↓	↓	↓	↓

Relinquished By	Date/Time	Received By	Date/Time
	11/29/23 1430		11/29/23 1430

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

BottleOrder: 84755

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

December 29, 2023

Elizabeth Hurley
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 23112078

Dear Elizabeth Hurley:

Order No.: 23120232

Summit Environmental Technologies, Inc. received 15 sample(s) on 12/4/2023 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

If you have any questions regarding these tests results, please feel free to call the laboratory.

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **23120232**
Date: **12/29/2023**

CLIENT: TEKLAB Inc,
Project: 23112078

This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

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All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

Summit Environmental Technologies, In
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Qualifiers and Acronyms

WO#: **23120232**
Date: **12/29/2023**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Workorder Sample Summary

WO#: **23120232**
29-Dec-23

CLIENT: TEKLAB Inc,
Project: 23112078

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
23120232-001	23112078-001		11/27/2023 2:10:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-002	23112078-002		11/27/2023 3:30:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-003	23112078-003		11/27/2023 4:35:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-004	23112078-004		11/28/2023 9:00:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-005	23112078-005		11/28/2023 10:35:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-006	23112078-006		11/28/2023 12:05:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-007	23112078-007		11/28/2023 1:20:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-008	23112078-008		11/28/2023 3:10:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-009	23112078-009		11/28/2023 4:30:00 PM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-010	23112078-010		11/29/2023 8:30:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-011	23112078-011		11/29/2023 10:00:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-012	23112078-012		11/29/2023 11:30:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-013	23112078-013		11/28/2023 12:01:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-014	23112078-014		11/29/2023 12:02:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water
23120232-015	23112078-015		11/27/2023 11:00:00 AM	12/4/2023 12:05:00 PM	Non-Potable Water

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DATES REPORT

WO#: **23120232**

29-Dec-23

Client: TEKLAB Inc,
Project: 23112078

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23120232-001A	23112078-001	11/27/2023 2:10:00 PM	Non-Potable Water	Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-002A	23112078-002	11/27/2023 3:30:00 PM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-003A	23112078-003	11/27/2023 4:35:00 PM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-004A	23112078-004	11/28/2023 9:00:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-005A	23112078-005	11/28/2023 10:35:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-006A	23112078-006	11/28/2023 12:05:00 PM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-007A	23112078-007	11/28/2023 1:20:00 PM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-008A	23112078-008	11/28/2023 3:10:00 PM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM

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DATES REPORT

WO#: **23120232**

29-Dec-23

Client: TEKLAB Inc,
Project: 23112078

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
23120232-008A	23112078-008	11/28/2023 3:10:00 PM	Non-Potable Water	Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-009A	23112078-009	11/28/2023 4:30:00 PM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-010A	23112078-010	11/29/2023 8:30:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-011A	23112078-011	11/29/2023 10:00:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-012A	23112078-012	11/29/2023 11:30:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-013A	23112078-013	11/28/2023 12:01:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-014A	23112078-014	11/29/2023 12:02:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM
23120232-015A	23112078-015	11/27/2023 11:00:00 AM		Combined Radium (EPA903+904)			12/28/2023 8:38:11 AM
				Radium-226 (EPA 903.0)		12/18/2023 3:46:12 PM	12/22/2023 10:59:00 AM
				Radium-228 (EPA 904.0)		12/18/2023 3:46:12 PM	12/21/2023 2:33:00 PM

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/27/2023 2:10:00 PM

Project: 23112078

Lab ID: 23120232-001

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.77	2.00	U	pCi/L	± 0.630	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.11	1.00	U	pCi/L	± 0.0500	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.66	1.00	JQDR	pCi/L	± 0.580	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

Original

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/27/2023 3:30:00 PM

Project: 23112078

Lab ID: 23120232-002

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-002

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.5	2.00	U	pCi/L	± 0.830	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.14	1.00	U	pCi/L	± 0.0600	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	1.36	1.00		pCi/L	± 0.770	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

Original

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/27/2023 4:35:00 PM

Project: 23112078

Lab ID: 23120232-003

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-003

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.27	2.00	U	pCi/L	± 0.750	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.32	1.00	U	pCi/L	± 0.0900	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.95	1.00	J	pCi/L	± 0.660	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
U	Samples with CalcVal < MDL
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode

Original

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 9:00:00 AM

Project: 23112078

Lab ID: 23120232-004

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-004

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.38	2.00	U	pCi/L	± 0.560	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.09	1.00	U	pCi/L	± 0.0500	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.29	1.00	U	pCi/L	± 0.510	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

Original

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 10:35:00 AM

Project: 23112078

Lab ID: 23120232-005

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-005

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.87	2.00	U	pCi/L	± 0.650	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.11	1.00	U	pCi/L	± 0.0500	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.76	1.00	J	pCi/L	± 0.600	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

Original

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 12:05:00 PM

Project: 23112078

Lab ID: 23120232-006

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-006

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.88	2.00	U	pCi/L	± 0.630	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.15	1.00	U	pCi/L	± 0.0600	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.73	1.00	J	pCi/L	± 0.570	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 1:20:00 PM

Project: 23112078

Lab ID: 23120232-007

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-007

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.68	2.00	U	pCi/L	± 0.700	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.12	1.00	U	pCi/L	± 0.0600	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.56	1.00	U	pCi/L	± 0.640	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 3:10:00 PM

Project: 23112078

Lab ID: 23120232-008

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-008

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.61	2.00	U	pCi/L	± 0.630	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.16	1.00	U	pCi/L	± 0.0600	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.45	1.00	U	pCi/L	± 0.570	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 4:30:00 PM

Project: 23112078

Lab ID: 23120232-009

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-009

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.25	2.00	U	pCi/L	± 0.590	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.1	1.00	U	pCi/L	± 0.0500	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.15	1.00	U	pCi/L	± 0.540	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

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WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/29/2023 8:30:00 AM

Project: 23112078

Lab ID: 23120232-010

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-010

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.85	2.00	U	pCi/L	± 0.710	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.19	1.00	U	pCi/L	± 0.0700	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.66	1.00	J	pCi/L	± 0.640	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/29/2023 10:00:00 AM

Project: 23112078

Lab ID: 23120232-011

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-011

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	1.21	2.00	U	pCi/L	± 0.750	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.24	1.00	U	pCi/L	± 0.0800	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.97	1.00	J	pCi/L	± 0.670	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

(consolidated)

WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/29/2023 11:30:00 AM

Project: 23112078

Lab ID: 23120232-012

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-012

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.8	2.00	U	pCi/L	± 0.670	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0	1.00	U	pCi/L	± 0.0200	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.8	1.00	J	pCi/L	± 0.650	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

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WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/28/2023 12:01:00 AM

Project: 23112078

Lab ID: 23120232-013

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-013

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.8	2.00	U	pCi/L	± 0.710	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.05	1.00	U	pCi/L	± 0.0400	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.75	1.00	J	pCi/L	± 0.670	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

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WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/29/2023 12:02:00 AM

Project: 23112078

Lab ID: 23120232-014

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-014

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.23	2.00	U	pCi/L	± 0.690	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.03	1.00	U	pCi/L	± 0.0300	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.2	1.00	U	pCi/L	± 0.660	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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Analytical Report

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WO#: **23120232**

Date Reported: **12/29/2023**

CLIENT: TEKLAB Inc,

Collection Date: 11/27/2023 11:00:00 AM

Project: 23112078

Lab ID: 23120232-015

Matrix: NON-POTABLE WATER

Client Sample ID: 23112078-015

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**CALCULATION**		Analyst: **CXS**
COMBINED RADIUM (EPA903+904)							
Radium-226/Radium-228	0.45	2.00	U	pCi/L	± 0.540	1	12/28/2023 8:38:11 AM
RAD226/228					**E903.0**	**E903-904**	Analyst: **SMZ**
RADIUM-226 (EPA 903.0)							
Radium-226	0.01	1.00	U	pCi/L	± 0.0200	1	12/22/2023 10:59:00 A
Yield	1					1	12/22/2023 10:59:00 A
RAD226/228					**E904.0**	**E903-904**	Analyst: **SMZ**
RADIUM-228 (EPA 904.0)							
Radium-228	0.44	1.00	U	pCi/L	± 0.520	1	12/21/2023 2:33:00 PM
Yield	1					1	12/21/2023 2:33:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as specified at testcode

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QC SUMMARY REPORT

WO#: **23120232**

29-Dec-23

Client: TEKLAB Inc,
Project: 23112078 **BatchID:** **71448**

Sample ID: **23120232-001A DUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **12/18/2023** RunNo: **176918**
Client ID: **23112078-001** Batch ID: **71448** TestNo: **E904.0** **E903-904** Analysis Date: **12/21/2023** SeqNo: **4792114**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	0.4	1.00		0	0			0.6600	200	30	RU
Yield	1			0	0			1.000	0		

Sample ID: **23120232-002A DUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **12/18/2023** RunNo: **176918**
Client ID: **23112078-002** Batch ID: **71448** TestNo: **E904.0** **E903-904** Analysis Date: **12/21/2023** SeqNo: **4792115**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	1.03	1.00		0	0			1.360	27.6	30	
Yield	1			0	0			1.000	0		

Qualifiers:

H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area respons
ND	Not Detected	PL	Permit Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as spe

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QC SUMMARY REPORT

WO#: **23120232**

29-Dec-23

Client: TEKLAB Inc,
Project: 23112078 **BatchID:** **71448**

Sample ID: **MB-71448**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **12/18/2023**	RunNo: **176918**
Client ID: **PBW**	Batch ID: **71448**	TestNo: **E904.0**	**E903-904**	Analysis Date: **12/21/2023**	SeqNo: **4792101**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						U
Yield	1.00			0	0						

Sample ID: **LCSD-71448**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **12/18/2023**	RunNo: **176918**
Client ID: **LCSS02**	Batch ID: **71448**	TestNo: **E904.0**	**E903-904**	Analysis Date: **12/21/2023**	SeqNo: **4792103**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.60	1.00	5.000	0	72.0	70	130	2.830	24.0	20	
Yield	0.990			0	0			1.000	1.01		

Sample ID: **RLCD-71448**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **12/18/2023**	RunNo: **176918**
Client ID: **BatchQC**	Batch ID: **71448**	TestNo: **E904.0**	**E903-904**	Analysis Date: **12/21/2023**	SeqNo: **4792106**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	1.16	1.00	1.000	0	116	50	150				
Yield	1.00			0	0						

Qualifiers:

H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area respons
ND	Not Detected	PL	Permit Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as spe

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QC SUMMARY REPORT

WO#: **23120232**

29-Dec-23

Client: TEKLAB Inc,
Project: 23112078 **BatchID:** **71448**

Sample ID: **MB-71448** SampType: **MBLK** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **12/18/2023** RunNo: **176923**
Client ID: **PBW** Batch ID: **71448** TestNo: **E903.0** **E903-904** Analysis Date: **12/22/2023** SeqNo: **4792235**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									U
Yield	1.00										

Sample ID: **LCS-71448** SampType: **LCS** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **12/18/2023** RunNo: **176923**
Client ID: **LCSW** Batch ID: **71448** TestNo: **E903.0** **E903-904** Analysis Date: **12/22/2023** SeqNo: **4792236**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.35	1.00	5.000	0	87.0	70	130				

Sample ID: **LCSD-71448** SampType: **LCSD** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **12/18/2023** RunNo: **176923**
Client ID: **LCSS02** Batch ID: **71448** TestNo: **E903.0** **E903-904** Analysis Date: **12/22/2023** SeqNo: **4792237**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.12	1.00	5.000	0	102	70	130	4.350	16.3	20	

Sample ID: **RLC-71448** SampType: **RLC** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **12/18/2023** RunNo: **176923**
Client ID: **BatchQC** Batch ID: **71448** TestNo: **E903.0** **E903-904** Analysis Date: **12/22/2023** SeqNo: **4792239**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area respons
ND	Not Detected	PL	Permit Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as spe

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QC SUMMARY REPORT

WO#: **23120232**

29-Dec-23

Client: TEKLAB Inc,
Project: 23112078 **BatchID:** **71448**

Sample ID: **RLC-71448**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **12/18/2023**	RunNo: **176923**
Client ID: **BatchQC**	Batch ID: **71448**	TestNo: **E903.0**	**E903-904**	Analysis Date: **12/22/2023**	SeqNo: **4792239**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	0.970	1.00	1.000	0	97.0	50	150				J

Sample ID: **RLCD-71448**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **12/18/2023**	RunNo: **176923**
Client ID: **BatchQC**	Batch ID: **71448**	TestNo: **E903.0**	**E903-904**	Analysis Date: **12/22/2023**	SeqNo: **4792240**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.13	1.00	1.000	0	113	50	150				

Qualifiers:

H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area respons
ND	Not Detected	PL	Permit Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	U	Samples with CalcVal < MDL	W	Sample container temperature is out of limit as spe

Original

TEKLAB, INC. Chain of Custody 23120232 Pg __ of __

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: ____ Sampler: Client QC Level: 3

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium (226, 228, and combined) on your standard TAT.

Receipt summary requested.

Project#: 23112078

Contact: Elizabeth Hurley Email: ehurley@teklabinc.com
Requested Due Date: 20 business days or less Billing/PO: 35417 Phone: 618 344 1004 ext 33

State of Origin: IL

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226	Radium 228	Combined Radium
	23112078-001	11/27/23 1410	HNO3	Groundwater	✓	✓	✓
	23112078-002	11/27/23 1530	HNO3	Groundwater	✓	✓	✓
	23112078-003	11/27/23 1635	HNO3	Groundwater	✓	✓	✓
	23112078-004	11/28/23 0900	HNO3	Groundwater	✓	✓	✓
	23112078-005	11/28/23 1035	HNO3	Groundwater	✓	✓	✓
	23112078-006	11/28/23 1205	HNO3	Groundwater	✓	✓	✓
	23112078-007	11/28/23 1320	HNO3	Groundwater	✓	✓	✓
	23112078-008	11/28/23 1510	HNO3	Groundwater	✓	✓	✓
	23112078-009	11/28/23 1630	HNO3	Groundwater	✓	✓	✓
	23112078-010	11/29/23 0830	HNO3	Groundwater	✓	✓	✓
	23112078-011	11/29/23 1000	HNO3	Groundwater	✓	✓	✓

*Relinquished By	Date/Time	Received By	Date/Time
[signature]	11/30/23 1700		
		[signature]	12-4-23 / 1205

13.1, 13.0, 13.5, 14.1 / coolers / FedEx

SubCocRevA
3/2/2016

3.3, 13.2, 12.7, 14.3 – 0.2 cf

Pg 23120232

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: | Sampler: Client | QC Level: 3

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium (226, 228, and combined) on your standard TAT.
Receipt summary requested.

Project# 23112078

Contact: Elizabeth Hurley | Email: ehurley@teklabinc.com
Requested Due Date: 20 business days or less | Billing/PO: 35417
Phone: 618 344 1004 ext 33

State of Origin: IL

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Changes to analysis/methods must be approved by Teklab, Inc.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226	Radium 228	Combined Radium											pH	CPM
	23112078-012	11/29/23 1130	HNO3	Groundwater	✔	✔	✔								1			7	27,33
	23112078-013	11/28/23 0001	HNO3	Groundwater	✔	✔	✔								1			7	11, 14
	23112078-014	11/29/23 0002	HNO3	Groundwater	✔	✔	✔								1			7	43,21
	23112078-015	11/27/23 1100	HNO3	Groundwater	✔	✔	✔								1			7	21,21
			HNO3	Groundwater															
			HNO3	Groundwater															
			HNO3	Groundwater															
			HNO3	Groundwater															
			HNO3	Groundwater															
			HNO3	Groundwater															
			HNO3	Groundwater															

*Relinquished By	Date/Time	Received By	Date/Time
	11/30/23 1700		
			12-4-23/1205

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 23120232 RcptNo: 1

Logged by:	Jacqueline Rasile	12/4/2023 12:05:00 PM	Jackie Rasile
Completed By:	Jacqueline Rasile	12/5/2023 1:21:38 PM	Jackie Rasile
Reviewed By:	Jennifer Woolf	12/5/2023 4:15:42 PM	Jennifer Woolf

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
	Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
	No. Seal Date:	Signed By:		
5.	Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
6.	Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☐	NA ☑
7.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
8.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
9.	Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
10.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
11.	Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes ☐	No ☐	No VOA Vials ☑
12.	Were any sample containers received broken?	Yes ☐	No ☑	
13.	Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
14.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
15.	Is it clear what analyses were requested?	Yes ☑	No ☐	
16.	Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	13.1	Good	Not Present			

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 23120232 RcptNo: 1

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
2	13.0	Good	Not Present			
3	13.5	Good	Not Present			
4	14.1	Good	Not Present			

APPENDIX E STATISTICAL EVALUATION

APPENDIX E1. TABLES

Table E1. Descriptive Statistics
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well Type	Well ID	Samples	Detects	Minimum	Maximum	Median	Mean	KM Mean	Std. Dev.	KM Std. Dev.
Antimony [ug/L]	Downgradient	APW-02	16	2 (12%)	1	4	1	1.256		0.7814	
		APW-03	16	0 (0%)	1	4	1	1.188		0.75	
		APW-05/05R	16	1 (6%)	1	4	1	1.194		0.7487	
		APW-06D	15	0 (0%)	1	4	1	1.2		0.7746	
		APW-06S	16	0 (0%)	1	4	1	1.188		0.75	
		APW-07	16	0 (0%)	1	4	1	1.188		0.75	
		APW-08	16	0 (0%)	1	4	1	1.188		0.75	
		APW-10D	16	0 (0%)	1	4	1	1.188		0.75	
		APW-10S	16	0 (0%)	1	4	1	1.188		0.75	
	Upgradient	APW-01R	16	0 (0%)	1	4	1	1.188		0.75	
		APW-04	16	0 (0%)	1	4	1	1.188		0.75	
		APW-09	16	1 (6%)	1	4	1	1.188		0.75	
		POOLED	48	1 (2%)	1	4	1	1.188		0.7339	
Arsenic [ug/L]	Downgradient	APW-02	16	16 (100%)	9.3	26	16.95	17.86		4.702	
		APW-03	16	15 (94%)	1.7	5.9	2.25	2.719	2.704	1.173	1.146
		APW-05/05R	16	16 (100%)	1.5	4.8	2.3	2.525		0.9154	
		APW-06D	15	15 (100%)	6.8	13.5	10.2	9.92		1.735	
		APW-06S	16	14 (88%)	1	2	1.2	1.369	1.324	0.3572	0.3126
		APW-07	16	9 (56%)	1	2.3	1.3	1.4	1.351	0.4546	0.4184
		APW-08	16	9 (56%)	1	2.5	1.3	1.462	1.414	0.5175	0.4901
		APW-10D	16	8 (50%)	1	5.7	1.2	1.631	1.585	1.161	1.127
		APW-10S	16	16 (100%)	174	276	190	197.1		24.77	
	Upgradient	APW-01R	16	13 (81%)	1	3.3	1.25	1.619	1.575	0.693	0.672
		APW-04	16	15 (94%)	1.4	2.9	1.75	1.888	1.865	0.4603	0.45
		APW-09	16	16 (100%)	1.8	3.1	2.2	2.284		0.3171	
		POOLED	48	44 (92%)	1	3.3	1.95	1.93	1.908	0.5739	0.578
Barium [ug/L]	Downgradient	APW-02	16	16 (100%)	149	739	344.5	355.4		174.7	
		APW-03	16	16 (100%)	80.6	190	136	133.8		33.02	
		APW-05/05R	16	16 (100%)	140	233	190	188.8		31.03	
		APW-06D	15	15 (100%)	115	173	148	148.7		16.07	
		APW-06S	16	16 (100%)	190	305	217.5	221.8		26.64	
		APW-07	16	16 (100%)	303	522	377	387.2		53.83	
		APW-08	16	16 (100%)	167	261	218	214.3		27.92	
		APW-10D	16	16 (100%)	276	485	350	360.2		58.91	
		APW-10S	16	16 (100%)	536	804	594	611.8		66.52	
	Upgradient	APW-01R	16	16 (100%)	165	259	179	185.6		22.81	
		APW-04	16	16 (100%)	123	165	139	140.1		10.88	
		APW-09	16	16 (100%)	118	227	130	139.7		29.8	
		POOLED	48	48 (100%)	118	259	143.5	155.1		31.02	
Beryllium [ug/L]	Downgradient	APW-02	16	1 (6%)	1	2	1	1.131		0.34	
		APW-03	16	0 (0%)	1	2	1	1.062		0.25	
		APW-05/05R	16	0 (0%)	1	2	1	1.125		0.3416	
		APW-06D	15	0 (0%)	1	2	1	1.067		0.2582	
		APW-06S	16	0 (0%)	1	2	1	1.062		0.25	
		APW-07	16	0 (0%)	1	2	1	1.062		0.25	
		APW-08	16	0 (0%)	1	2	1	1.062		0.25	
		APW-10D	16	0 (0%)	1	2	1	1.062		0.25	
		APW-10S	16	0 (0%)	1	2	1	1.062		0.25	
	Upgradient	APW-01R	16	0 (0%)	1	2	1	1.062		0.25	
		APW-04	16	0 (0%)	1	2	1	1.062		0.25	
		APW-09	16	0 (0%)	1	2	1	1.062		0.25	
		POOLED	48	0 (0%)	1	2	1	1.062		0.2446	
Boron [mg/L]	Downgradient	APW-02	15	15 (100%)	7.75	9.62	8.73	8.661		0.5443	
		APW-03	15	15 (100%)	1.84	4.94	4.27	4.095		0.9116	
		APW-05/05R	15	15 (100%)	7.12	10.3	8.89	8.743		1.032	
		APW-06D	14	14 (100%)	3.09	5.51	3.825	3.943		0.6328	
		APW-06S	15	15 (100%)	4.65	9.19	5.93	6.281		1.105	
		APW-07	15	15 (100%)	0.168	0.342	0.274	0.2608		0.05232	
		APW-08	15	15 (100%)	0.095	0.155	0.132	0.1283		0.01991	
		APW-10D	15	15 (100%)	0.0522	0.118	0.0843	0.083		0.01684	
		APW-10S	15	15 (100%)	0.525	0.683	0.569	0.5763		0.0416	
	Upgradient	APW-01R	15	15 (100%)	0.176	0.357	0.228	0.2448		0.05144	
		APW-04	15	15 (100%)	0.559	2.37	1.33	1.418		0.6777	
		APW-09	15	15 (100%)	0.191	1.61	0.369	0.5089		0.3736	
		POOLED	45	45 (100%)	0.176	2.37	0.369	0.7237		0.6704	

Table E1. Descriptive Statistics
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well Type	Well ID	Samples	Detects	Minimum	Maximum	Median	Mean	KM Mean	Std. Dev.	KM Std. Dev.
Cadmium [ug/L]	Downgradient	APW-02	16	1 (6%)	1	1	1	1		0	
		APW-03	16	1 (6%)	1	1	1	1		0	
		APW-05/05R	16	0 (0%)	1	1	1	1		0	
		APW-06D	15	0 (0%)	1	1	1	1		0	
		APW-06S	16	0 (0%)	1	1	1	1		0	
		APW-07	16	0 (0%)	1	1	1	1		0	
		APW-08	16	1 (6%)	1	1	1	1		0	
		APW-10D	16	1 (6%)	1	1.1	1	1.006		0.025	
		APW-10S	16	0 (0%)	1	1	1	1		0	
	Upgradient	APW-01R	16	0 (0%)	1	1	1	1		0	
		APW-04	16	0 (0%)	1	1	1	1		0	
		APW-09	16	0 (0%)	1	1	1	1		0	
		POOLED	48	0 (0%)	1	1	1	1		0	
Calcium [mg/L]	Downgradient	APW-02	15	15 (100%)	132	198	148	154.9		20.67	
		APW-03	15	15 (100%)	74.9	153	111	109.5		23.54	
		APW-05/05R	15	15 (100%)	97.1	142	124	122.8		11.87	
		APW-06D	14	14 (100%)	96.7	128	106.5	108.2		9.084	
		APW-06S	15	15 (100%)	87.5	115	98.1	99.2		6.968	
		APW-07	15	15 (100%)	161	238	192	193.1		18.36	
		APW-08	15	15 (100%)	79.4	105	95	93.13		8.202	
		APW-10D	15	15 (100%)	115	611	123	174		137.1	
		APW-10S	15	15 (100%)	129	171	145	145.9		11.17	
	Upgradient	APW-01R	15	15 (100%)	59.2	97.1	88.2	84.93		10.58	
		APW-04	15	15 (100%)	87.9	124	102	103.3		9.315	
		APW-09	15	15 (100%)	69.5	110	81.9	84.44		8.904	
		POOLED	45	45 (100%)	59.2	124	89.5	90.9		12.95	
Chloride [mg/L]	Downgradient	APW-02	16	16 (100%)	7	13	11	10.24		2.001	
		APW-03	16	16 (100%)	8.04	23	20	18.32		4.136	
		APW-05/05R	16	16 (100%)	14	19	16	16.12		1.54	
		APW-06D	15	15 (100%)	14	22	16	16.88		2.095	
		APW-06S	16	16 (100%)	20	31	25	25.01		2.762	
		APW-07	16	16 (100%)	9	16	14	13.16		2.189	
		APW-08	16	16 (100%)	9	13	10.3	10.6		1.083	
		APW-10D	16	16 (100%)	10	24	15.7	15.4		3.262	
		APW-10S	16	16 (100%)	6	21	11	11.58		5.61	
	Upgradient	APW-01R	16	10 (62%)	2	11	6	6.442	5.379	2.399	3.262
		APW-04	16	16 (100%)	9	12	11	10.76		0.9058	
		APW-09	16	16 (100%)	11	768	13	59.76		188.9	
		POOLED	48	42 (88%)	2	768	11	25.65	25.3	109.5	108.4
Chromium [ug/L]	Downgradient	APW-02	16	15 (94%)	2	127	19.15	33.73	33.73	37.87	36.67
		APW-03	16	10 (62%)	1	24.1	2.55	5.125	5.009	5.971	5.855
		APW-05/05R	16	7 (44%)	1	13.7	1.75	3.1		3.384	
		APW-06D	15	8 (53%)	1	72.7	1.5	7.281	7.204	18.25	17.66
		APW-06S	16	9 (56%)	1	17.3	1.95	3.244	3.107	4.045	3.98
		APW-07	16	9 (56%)	1	32.9	2.05	4.388	4.269	7.777	7.577
		APW-08	16	11 (69%)	1	8.2	2.2	2.975	2.927	2.113	2.079
		APW-10D	16	10 (62%)	1	14.8	2.05	3.244	3.128	3.557	3.504
		APW-10S	16	13 (81%)	1	15	1.9	3.494	3.46	3.951	3.842
	Upgradient	APW-01R	16	13 (81%)	1	8.5	2.25	2.792	2.761	1.88	1.847
		APW-04	16	11 (69%)	1	25.1	2.4	3.748	3.686	5.797	5.64
		APW-09	16	7 (44%)	1	14.8	1.5	2.275		3.358	
		POOLED	48	31 (65%)	1	25.1	1.75	2.939	2.851	3.979	3.972
Cobalt [ug/L]	Downgradient	APW-02	16	12 (75%)	1	11	2.5	3.55	3.504	2.983	2.92
		APW-03	16	5 (31%)	1	2.1	1	1.212		0.3704	
		APW-05/05R	16	1 (6%)	1	2	1	1.125		0.3416	
		APW-06D	15	7 (47%)	1	5.4	1	1.747		1.329	
		APW-06S	16	1 (6%)	1	2	1	1.062		0.25	
		APW-07	16	2 (12%)	1	2	1	1.081		0.2562	
		APW-08	16	11 (69%)	1	2.1	1.3	1.419	1.374	0.407	0.3723
		APW-10D	16	16 (100%)	1.3	7	3.05	3.213		1.328	
		APW-10S	16	5 (31%)	1	2.1	1	1.238		0.4241	
	Upgradient	APW-01R	16	7 (44%)	1	4.1	1.15	1.625		0.927	
		APW-04	16	4 (25%)	1	2.5	1	1.188		0.4334	
		APW-09	16	3 (19%)	1	3.1	1	1.219		0.5659	
		POOLED	48	14 (29%)	1	4.1	1	1.344		0.6906	

Table E1. Descriptive Statistics
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well Type	Well ID	Samples	Detects	Minimum	Maximum	Median	Mean	KM Mean	Std. Dev.	KM Std. Dev.
Dissolved Solids, Total [mg/L]	Downgradient	APW-02	16	16 (100%)	820	934	882.5	880.8		35.82	
		APW-03	16	16 (100%)	450	724	519	542.6		76.63	
		APW-05/05R	16	16 (100%)	552	842	745	740.9		79.41	
		APW-06D	14	14 (100%)	482	735	564.5	580.6		59.4	
		APW-06S	16	16 (100%)	500	666	599	593.6		45.29	
		APW-07	16	16 (100%)	624	824	741	749.2		52.44	
		APW-08	16	16 (100%)	370	466	415	413.8		33.47	
		APW-10D	16	16 (100%)	436	512	460	462.5		19.3	
		APW-10S	15	15 (100%)	678	900	735	747.1		52.73	
	Upgradient	APW-01R	15	15 (100%)	300	474	385	387.7		44.4	
		APW-04	16	16 (100%)	416	528	449	456.9		34.45	
		APW-09	15	15 (100%)	278	3380	372	565.9		779.2	
		POOLED	46	46 (100%)	278	3380	406	469.8		441.9	
Fluoride [ug/L]	Downgradient	APW-02	16	16 (100%)	220	260	240	242.5		12.91	
		APW-03	16	16 (100%)	200	340	265	264.5		38.24	
		APW-05/05R	16	16 (100%)	298	380	330	334.9		23.01	
		APW-06D	15	15 (100%)	200	240	220	218.1		12.57	
		APW-06S	16	16 (100%)	240	410	273.5	283.6		42.43	
		APW-07	16	16 (100%)	170	350	190	197.6		42.42	
		APW-08	16	16 (100%)	232	300	280	278.2		19.07	
		APW-10D	16	13 (81%)	100	150	110	113.1	110.7	14.93	11.23
		APW-10S	16	15 (94%)	150	210	160	166.2	166.2	16.28	15.76
	Upgradient	APW-01R	16	16 (100%)	120	210	165	162.7		21.31	
		APW-04	16	16 (100%)	150	200	170	171.9		13.28	
		APW-09	16	16 (100%)	190	230	200	201.7		12.28	
		POOLED	48	48 (100%)	120	230	180	178.8		23.07	
Iron [mg/L]	Downgradient	APW-02	2	2 (100%)	7.63	11.7	9.665	9.665		2.878	
		APW-03	2	2 (100%)	0.367	1.66	1.0135	1.014		0.9143	
		APW-05/05R	2	2 (100%)	2.77	5.89	4.33	4.33		2.206	
		APW-06D	1	1 (100%)	3.65	3.65	3.65	3.65			
		APW-06S	2	2 (100%)	9.18	9.35	9.265	9.265		0.1202	
		APW-07	2	2 (100%)	17.3	18.9	18.1	18.1		1.131	
		APW-08	2	2 (100%)	0.44	3.14	1.79	1.79		1.909	
		APW-10D	2	2 (100%)	0.175	0.758	0.4665	0.4665		0.4122	
		APW-10S	2	2 (100%)	17.2	19.6	18.4	18.4		1.697	
	Upgradient	APW-01R	2	2 (100%)	0.405	1.42	0.9125	0.9125		0.7177	
		APW-04	2	2 (100%)	0.563	0.709	0.636	0.636		0.1032	
		APW-09	2	2 (100%)	0.179	0.496	0.3375	0.3375		0.2242	
		POOLED	6	6 (100%)	0.179	1.42	0.5295	0.6287		0.4259	
Lead [ug/L]	Downgradient	APW-02	16	16 (100%)	2	23.9	5.1	7.409		6.594	
		APW-03	16	6 (38%)	1	4.4	1	1.762		1.158	
		APW-05/05R	16	3 (19%)	1	2.6	1	1.231		0.4976	
		APW-06D	15	2 (13%)	1	2	1	1.12		0.2908	
		APW-06S	16	1 (6%)	1	2.8	1	1.175		0.5	
		APW-07	16	1 (6%)	1	7.4	1	1.462		1.603	
		APW-08	16	5 (31%)	1	2.8	1	1.356		0.5831	
		APW-10D	16	2 (12%)	1	2	1	1.125		0.3416	
		APW-10S	16	5 (31%)	1	4.3	1	1.462		0.9451	
	Upgradient	APW-01R	16	5 (31%)	1	6.2	1	1.594		1.322	
		APW-04	16	1 (6%)	1	2	1	1.1		0.2828	
		APW-09	16	1 (6%)	1	3.9	1	1.244		0.751	
		POOLED	48	7 (15%)	1	6.2	1	1.312		0.8984	
Lithium [ug/L]	Downgradient	APW-02	16	16 (100%)	38.6	64.7	48.7	49.49		7.36	
		APW-03	16	16 (100%)	23.9	36.1	29.9	29.69		3.989	
		APW-05/05R	16	16 (100%)	33.1	52.3	40.15	40.41		4.228	
		APW-06D	15	15 (100%)	16	19.9	17.3	17.35		1.087	
		APW-06S	16	16 (100%)	33.5	56.4	41.25	41.54		4.997	
		APW-07	16	16 (100%)	14.1	23.1	17.7	17.36		2.241	
		APW-08	16	16 (100%)	14.2	22.3	19.4	18.51		2.775	
		APW-10D	16	16 (100%)	12.6	18	15	15.02		1.119	
		APW-10S	16	16 (100%)	26.3	40.1	30.4	30.94		3.375	
	Upgradient	APW-01R	16	16 (100%)	14.2	18.9	16.65	16.55		1.35	
		APW-04	16	16 (100%)	29	42.4	37.85	36.09		5.258	
		APW-09	16	16 (100%)	13.1	24.6	15.6	16.07		2.836	
		POOLED	48	48 (100%)	13.1	42.4	17.45	22.9		10.04	

Table E1. Descriptive Statistics
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Analyte	Well Type	Well ID	Samples	Detects	Minimum	Maximum	Median	Mean	KM Mean	Std. Dev.	KM Std. Dev.
Manganese [mg/L]	Downgradient	APW-02	2	2 (100%)	0.669	0.752	0.7105	0.7105		0.05869	
		APW-03	2	2 (100%)	0.321	0.435	0.378	0.378		0.08061	
		APW-05/05R	2	2 (100%)	0.554	0.9	0.727	0.727		0.2447	
		APW-06D	1	1 (100%)	0.622	0.622	0.622	0.622			
		APW-06S	2	2 (100%)	0.512	0.53	0.521	0.521		0.01273	
		APW-07	2	2 (100%)	1.11	1.19	1.15	1.15		0.05657	
		APW-08	2	2 (100%)	0.0435	0.202	0.12275	0.1228		0.1121	
		APW-10D	2	2 (100%)	0.88	1.16	1.02	1.02		0.198	
		APW-10S	2	2 (100%)	0.174	0.243	0.2085	0.2085		0.04879	
	Upgradient	APW-01R	2	2 (100%)	0.0791	0.139	0.10905	0.109		0.04236	
		APW-04	2	2 (100%)	0.192	0.21	0.201	0.201		0.01273	
		APW-09	2	2 (100%)	0.124	0.599	0.3615	0.3615		0.3359	
		POOLED	6	6 (100%)	0.0791	0.599	0.1655	0.2238		0.1898	
Mercury [ug/L]	Downgradient	APW-02	16	1 (6%)	0.2	0.43	0.2	0.2144		0.0575	
		APW-03	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-05/05R	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-06D	15	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-06S	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-07	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-08	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-10D	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-10S	16	0 (0%)	0.2	0.2	0.2	0.2		0	
	Upgradient	APW-01R	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-04	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		APW-09	16	0 (0%)	0.2	0.2	0.2	0.2		0	
		POOLED	48	0 (0%)	0.2	0.2	0.2	0.2		0	
Molybdenum [ug/L]	Downgradient	APW-02	16	16 (100%)	95.1	240	165	165.6		40.38	
		APW-03	16	16 (100%)	26.2	84.9	65.25	62.29		17.6	
		APW-05/05R	16	16 (100%)	168	249	214.5	213.2		24.52	
		APW-06D	15	15 (100%)	46.3	71.9	60.2	60.46		7.409	
		APW-06S	16	16 (100%)	207	324	262	265		34.08	
		APW-07	16	15 (94%)	2.3	5	3.4	3.494	3.393	0.738	0.6191
		APW-08	16	3 (19%)	1	5	1.3	1.481		0.9683	
		APW-10D	16	1 (6%)	1	5	1.5	1.556		0.9919	
		APW-10S	16	3 (19%)	1	5	1.5	1.588		0.9674	
	Upgradient	APW-01R	16	0 (0%)	1	5	1.25	1.469		0.9741	
		APW-04	16	16 (100%)	29.9	89.1	58.1	59.08		20.69	
		APW-09	16	16 (100%)	15	45.5	22.3	23.24		7.743	
		POOLED	48	32 (67%)	1	89.1	22.3	27.93	27.77	27.06	26.92
Nickel [ug/L]	Downgradient	APW-02	10	10 (100%)	4.5	72.5	27.55	31.38		21.84	
		APW-03	10	8 (80%)	1	10	2.55	3.39	3.39	2.825	2.68
		APW-05/05R	10	7 (70%)	1	7.4	2.05	2.6	2.6	2.041	1.936
		APW-06D	9	9 (100%)	1.7	9.3	2.5	3.189		2.359	
		APW-06S	10	9 (90%)	1	9	2.1	2.63	2.63	2.34	2.22
		APW-07	10	5 (50%)	1	15	1.15	3.02	3.02	4.359	4.135
		APW-08	10	10 (100%)	2.6	7.7	3.4	4.09		1.804	
		APW-10D	10	10 (100%)	2.5	9.5	6.4	6.12		2.024	
		APW-10S	10	6 (60%)	1	5.1	1.3	1.77	1.77	1.329	1.261
	Upgradient	APW-01R	10	10 (100%)	3.8	12	5.2	5.94		2.497	
		APW-04	10	10 (100%)	2	6.5	3.2	3.59		1.436	
		APW-09	10	6 (60%)	1	12	1.1	2.73	2.73	3.428	3.252
		POOLED	30	26 (87%)	1	12	3.85	4.087	4.087	2.851	2.803
pH, Lab [SU]	Downgradient	APW-02	16	16 (100%)	6.9	7.52	7.075	7.106		0.1485	
		APW-03	16	16 (100%)	7.21	7.93	7.49	7.572		0.2426	
		APW-05/05R	16	16 (100%)	7.18	7.55	7.305	7.315		0.08656	
		APW-06D	15	15 (100%)	7.19	7.73	7.23	7.295		0.1409	
		APW-06S	16	16 (100%)	7.02	7.67	7.125	7.174		0.1611	
		APW-07	16	16 (100%)	6.78	7.31	6.875	6.929		0.1487	
		APW-08	16	16 (100%)	7	7.68	7.17	7.208		0.1815	
		APW-10D	16	16 (100%)	6.98	7.66	7.115	7.173		0.1907	
		APW-10S	16	16 (100%)	6.91	7.58	7	7.063		0.1653	
	Upgradient	APW-01R	16	16 (100%)	6.43	7.19	6.65	6.758		0.2465	
		APW-04	16	16 (100%)	7.2	8.17	7.33	7.398		0.2271	
		APW-09	16	16 (100%)	7.31	8.03	7.45	7.488		0.1875	
		POOLED	48	48 (100%)	6.43	8.17	7.32	7.214		0.3937	

Table E1. Descriptive Statistics
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Analyte	Well Type	Well ID	Samples	Detects	Minimum	Maximum	Median	Mean	KM Mean	Std. Dev.	KM Std. Dev.
Radium-226/228 [pCi/L]	Downgradient	APW-02	15	15 (100%)	0.476	4.09	2	1.967		0.8623	
		APW-03	16	16 (100%)	0.776	3.18	2	2		0.4921	
		APW-05/05R	15	15 (100%)	0.798	6.34	2	2.282		1.278	
		APW-06D	15	15 (100%)	1.38	2.8	2	1.985		0.2811	
		APW-06S	16	16 (100%)	0.497	2.93	2	1.869		0.5163	
		APW-07	16	16 (100%)	1.1	2.7	2	1.949		0.3438	
		APW-08	16	16 (100%)	0.611	2.39	2	1.839		0.4779	
		APW-10D	16	16 (100%)	1.03	2	2	1.833		0.314	
		APW-10S	16	16 (100%)	1.24	4.83	2	2.199		0.8366	
	Upgradient	APW-01R	16	16 (100%)	0.691	2.54	2	1.838		0.5036	
		APW-04	16	16 (100%)	0.497	2.65	2	1.809		0.5181	
		APW-09	16	16 (100%)	0.503	2	2	1.742		0.5216	
		POOLED	48	48 (100%)	0.497	2.65	2	1.796		0.5051	
Selenium [ug/L]	Downgradient	APW-02	16	1 (6%)	1	2	1	1.094		0.272	
		APW-03	16	2 (12%)	1	2	1	1.125		0.3235	
		APW-05/05R	16	0 (0%)	1	2	1	1.062		0.25	
		APW-06D	15	0 (0%)	1	2	1	1.067		0.2582	
		APW-06S	16	0 (0%)	1	2	1	1.062		0.25	
		APW-07	16	0 (0%)	1	2	1	1.062		0.25	
		APW-08	16	16 (100%)	3.6	22.1	13.35	12.93		4.141	
		APW-10D	16	13 (81%)	1	3.3	1.35	1.637	1.637	0.6984	0.6762
		APW-10S	16	0 (0%)	1	2	1	1.062		0.25	
	Upgradient	APW-01R	16	16 (100%)	2.8	5.4	3.8	3.921		0.644	
		APW-04	16	16 (100%)	8.5	16.5	13.15	12.68		2.742	
		APW-09	16	16 (100%)	12.6	22.5	15.2	16.73		3.378	
		POOLED	48	48 (100%)	2.8	22.5	12.8	11.11		5.947	
Sulfate [mg/L]	Downgradient	APW-02	16	16 (100%)	411	500	460	456.6		28.6	
		APW-03	16	16 (100%)	80.1	393	202.5	212.4		77.93	
		APW-05/05R	16	16 (100%)	224	460	378.5	364.8		57.99	
		APW-06D	15	15 (100%)	180	272	222	225.6		30.33	
		APW-06S	16	16 (100%)	127	247	214	205.5		35.34	
		APW-07	16	16 (100%)	40	78	60	58.42		10.84	
		APW-08	16	16 (100%)	23	43	38	34.86		6.449	
		APW-10D	16	16 (100%)	26	44	42	40.16		5.246	
		APW-10S	16	2 (12%)	5	21	10	10.38		3.096	
	Upgradient	APW-01R	16	16 (100%)	33	88	68.95	64.68		16.09	
		APW-04	16	16 (100%)	50.9	126	93	88.24		24.52	
		APW-09	16	16 (100%)	25	104	40.5	46.27		19.32	
		POOLED	48	48 (100%)	25	126	65	66.4		26.36	
Thallium [ug/L]	Downgradient	APW-02	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-03	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-05/05R	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-06D	15	0 (0%)	1	2	1	1.467		0.5164	
		APW-06S	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-07	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-08	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-10D	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-10S	16	0 (0%)	1	2	1.5	1.5		0.5164	
	Upgradient	APW-01R	16	1 (6%)	1	2	1.7	1.525		0.5	
		APW-04	16	0 (0%)	1	2	1.5	1.5		0.5164	
		APW-09	16	1 (6%)	1	2	1.5	1.5		0.5164	
		POOLED	48	2 (4%)	1	2	1.7	1.508		0.5001	

Table E1. Descriptive Statistics
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Analyte	Well Type	Well ID	Samples	Detects	Minimum	Maximum	Median	Mean	KM Mean	Std. Dev.	KM Std. Dev.
Turbidity, Field [NTU]	Downgradient	APW-02	8	8 (100%)	19.2	169	100.5	94.64		47.83	
		APW-03	8	8 (100%)	2.72	103	23.71	33.75		35.76	
		APW-05/05R	8	8 (100%)	4.65	76.1	36.3	33.14		24.85	
		APW-06D	7	7 (100%)	3.02	181	26.9	55.36		61.29	
		APW-06S	8	8 (100%)	1.26	30.5	7.83	10.06		9.258	
		APW-07	8	8 (100%)	4.36	79.2	27.9	34.22		27.07	
		APW-08	8	8 (100%)	23.1	305	140	134.4		88.53	
		APW-10D	8	8 (100%)	4.76	196	46.1	87.03		78.77	
		APW-10S	8	8 (100%)	3.78	63.6	44.95	40.42		22.51	
	Upgradient	APW-01R	8	8 (100%)	25.6	133	58.55	65.53		40.05	
		APW-04	8	8 (100%)	18.3	38.7	24.65	26.76		7.888	
		APW-09	8	8 (100%)	3.82	34.2	10.35	14.99		11.15	
		POOLED	24	24 (100%)	3.82	133	26.05	35.76		32.11	

Notes:

ug/L = microgram per liter

pCi/L = picocuries per liter

SU = standard units

KM = Kaplan-Meier; these values are only provided for groups with <50% non-detects

Table E2. Summary of Potential Statistical Outliers
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Well Type	Well ID	Analyte	Potential Outlier(s)	Max Upgradient Concentration
Downgradient	APW-03	Arsenic [ug/L]	5.9	3.3
Downgradient	APW-10D	Arsenic [ug/L]	5.7	3.3
Downgradient	APW-10S	Arsenic [ug/L]	276	3.3
Downgradient	APW-06S	Barium [ug/L]	305	259
Downgradient	APW-07	Barium [ug/L]	522	259
Downgradient	APW-10S	Barium [ug/L]	804	259
Downgradient	APW-06D	Boron [mg/L]	4.99; 5.51	2.37
Downgradient	APW-10D	Calcium [mg/L]	374; 611	124
Downgradient	APW-06D	Chloride [mg/L]	21.2; 22	768
Downgradient	APW-03	Chromium [ug/L]	24.1	25.1
Downgradient	APW-06D	Chromium [ug/L]	72.7	25.1
Downgradient	APW-06S	Chromium [ug/L]	17.3	25.1
Downgradient	APW-07	Chromium [ug/L]	32.9	25.1
Downgradient	APW-10D	Chromium [ug/L]	14.8	25.1
Downgradient	APW-10S	Chromium [ug/L]	8.7; 9.1; 15	25.1
Downgradient	APW-03	Cobalt [ug/L]	2.1	4.1
Downgradient	APW-10D	Cobalt [ug/L]	7	4.1
Downgradient	APW-06D	Dissolved Solids, Total [mg/L]	670; 735	3380
Downgradient	APW-06S	Fluoride [ug/L]	410	230
Downgradient	APW-07	Fluoride [ug/L]	350	230
Downgradient	APW-10S	Fluoride [ug/L]	210	230
Downgradient	APW-05/05R	Lithium [ug/L]	52.3	42.4
Downgradient	APW-06S	Lithium [ug/L]	56.4	42.4
Downgradient	APW-06D	Nickel [ug/L]	9.3	12
Downgradient	APW-06S	Nickel [ug/L]	9	12
Downgradient	APW-07	Nickel [ug/L]	15	12
Downgradient	APW-02	pH, Lab [SU]	7.52	8.17
Downgradient	APW-06D	pH, Lab [SU]	7.73	8.17
Downgradient	APW-06S	pH, Lab [SU]	7.67	8.17
Downgradient	APW-10S	pH, Lab [SU]	7.58	8.17
Downgradient	APW-02	Radium-226/228 [pCi/L]	3.04; 4.09	2.65
Downgradient	APW-03	Radium-226/228 [pCi/L]	2.09; 2.58; 3.	2.65
Downgradient	APW-05/05R	Radium-226/228 [pCi/L]	3.86; 6.34	2.65
Downgradient	APW-06D	Radium-226/228 [pCi/L]	2.8	2.65
Downgradient	APW-06S	Radium-226/228 [pCi/L]	2.93	2.65
Downgradient	APW-07	Radium-226/228 [pCi/L]	2.1; 2.7	2.65
Downgradient	APW-08	Radium-226/228 [pCi/L]	2.08; 2.39	2.65
Downgradient	APW-10S	Radium-226/228 [pCi/L]	2.82; 3; 4.83	2.65
Downgradient	APW-06S	Turbidity, Field [NTU]	30.5	133
Upgradient	APW-09	Barium [ug/L]	186; 227	259
Upgradient	APW-09	Calcium [mg/L]	110	124
Upgradient	(POOLED)	Chloride [mg/L]	768	768
Upgradient	APW-09	Chloride [mg/L]	768	768
Upgradient	(POOLED)	Chromium [ug/L]	14.8; 25.1	25.1
Upgradient	APW-01R	Chromium [ug/L]	8.5	25.1
Upgradient	APW-04	Chromium [ug/L]	25.1	25.1
Upgradient	APW-09	Chromium [ug/L]	14.8	25.1
Upgradient	(POOLED)	Dissolved Solids, Total [mg/L]	3380	3380
Upgradient	APW-09	Dissolved Solids, Total [mg/L]	3380	3380
Upgradient	(POOLED)	Iron [mg/L]	1.42	1.42
Upgradient	(POOLED)	Manganese [mg/L]	0.599	0.599
Upgradient	APW-09	Molybdenum [ug/L]	45.5	89.1

Table E2. Summary of Potential Statistical Outliers
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Well Type	Well ID	Analyte	Potential Outlier(s)	Max Upgradient Concentration
Upgradient	APW-01R	Nickel [ug/L]	12	12
Upgradient	APW-09	Nickel [ug/L]	12	12
Upgradient	APW-04	pH, Lab [SU]	8.17	8.17
Upgradient	(POOLED)	Radium-226/228 [pCi/L]	2.18; 2.54; 2.	2.65
Upgradient	APW-01R	Radium-226/228 [pCi/L]	2.18; 2.54	2.65
Upgradient	APW-04	Radium-226/228 [pCi/L]	2.65	2.65
Upgradient	APW-01R	Selenium [ug/L]	5.4	22.5
Upgradient	APW-09	Sulfate [mg/L]	104	126
Upgradient	(POOLED)	Turbidity, Field [NTU]	83.2; 89.5; 9	133

Notes:

ug/L = microgram per liter

pCi/L = picocuries per liter

SU = Standard Units

Potential outliers were analyzed with Tukey's outlier test. Only detected values from well/analyte pairs with ≥ 4 detections were tested.

Table E3. Summary of Background Concentrations
Annual Groundwater Report
Grand Tower Energy Center

Analyte	Distribution	Background Concentration (95/95 UTL)
Antimony [ug/L]	Insufficient Data	1
Arsenic [ug/L]	Normal	3.11
Barium [ug/L]	No Distribution Detected	241.9
Beryllium [ug/L]	Insufficient Data	2
Boron [mg/L]	Gamma	1.354
Cadmium [ug/L]	Insufficient Data	1
Calcium [mg/L]	Normal	118.3
Chloride [mg/L]	No Distribution Detected	12.84
Chromium [ug/L]	No Distribution Detected	25.1
Cobalt [ug/L]	Normal	2.685
Dissolved Solids, Total [mg/L]	Normal	514.7
Fluoride [ug/L]	Normal	226.1
Iron [mg/L]	Normal	2.208
Lead [ug/L]	Normal	3.086
Lithium [ug/L]	No Distribution Detected	32.42
Manganese [mg/L]	Normal	0.928
Mercury [ug/L]	Insufficient Data	0.2
Molybdenum [ug/L]	Normal	55.02
Nickel [ug/L]	Normal	10.42
pH, Lab [SU]	Normal	8.113
Radium-226/228 [pCi/L]	No Distribution Detected	2.54
Selenium [ug/L]	No Distribution Detected	22.95
Sulfate [mg/L]	Normal	93.25
Thallium [ug/L]	No Distribution Detected	2
Turbidity, Field [NTU]	Gamma	132

Notes:

ug/L = microgram per liter

pCi/L = picocuries per liter

SU = standard units

95/95 UTL = upper tolerance limit with 95% converage and 95% confidence

Table E4. Summary of Downgradient Confidence Limits
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well	Distribution	95% LCL	95% UCL
Antimony [ug/L]	APW-02	No Distribution Detected		1.249
Antimony [ug/L]	APW-03	Insufficient Data		
Antimony [ug/L]	APW-05/05R	Insufficient Data		
Antimony [ug/L]	APW-06D	Insufficient Data		
Antimony [ug/L]	APW-06S	Insufficient Data		
Antimony [ug/L]	APW-07	Insufficient Data		
Antimony [ug/L]	APW-08	Insufficient Data		
Antimony [ug/L]	APW-10D	Insufficient Data		
Antimony [ug/L]	APW-10S	Insufficient Data		
Arsenic [ug/L]	APW-02	Normal		19.92
Arsenic [ug/L]	APW-03	Normal		3.224
Arsenic [ug/L]	APW-05/05R	Normal		2.926
Arsenic [ug/L]	APW-06D	Normal		10.71
Arsenic [ug/L]	APW-06S	Normal		1.469
Arsenic [ug/L]	APW-07	Normal		1.548
Arsenic [ug/L]	APW-08	Normal		1.645
Arsenic [ug/L]	APW-10D	No Distribution Detected		2.114
Arsenic [ug/L]	APW-10S	No Distribution Detected		207.9
Barium [ug/L]	APW-02	Normal		431.9
Barium [ug/L]	APW-03	Normal		148.2
Barium [ug/L]	APW-05/05R	Normal		202.4
Barium [ug/L]	APW-06D	Normal		156
Barium [ug/L]	APW-06S	No Distribution Detected		233.4
Barium [ug/L]	APW-07	Normal		410.8
Barium [ug/L]	APW-08	Normal		226.5
Barium [ug/L]	APW-10D	Normal		386
Barium [ug/L]	APW-10S	Normal		640.9
Beryllium [ug/L]	APW-02	Insufficient Data		
Beryllium [ug/L]	APW-03	Insufficient Data		
Beryllium [ug/L]	APW-05/05R	Insufficient Data		
Beryllium [ug/L]	APW-06D	Insufficient Data		
Beryllium [ug/L]	APW-06S	Insufficient Data		
Beryllium [ug/L]	APW-07	Insufficient Data		
Beryllium [ug/L]	APW-08	Insufficient Data		
Beryllium [ug/L]	APW-10D	Insufficient Data		
Beryllium [ug/L]	APW-10S	Insufficient Data		
Boron [mg/L]	APW-02	Normal		8.908
Boron [mg/L]	APW-03	No Distribution Detected		4.509
Boron [mg/L]	APW-05/05R	Normal		9.212
Boron [mg/L]	APW-06D	Normal		4.242
Boron [mg/L]	APW-06S	Normal		6.783
Boron [mg/L]	APW-07	Normal		0.285
Boron [mg/L]	APW-08	Normal		0.137
Boron [mg/L]	APW-10D	Normal		0.0907

Table E4. Summary of Downgradient Confidence Limits
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well	Distribution	95% LCL	95% UCL
Boron [mg/L]	APW-10S	Normal		0.595
Cadmium [ug/L]	APW-02	Insufficient Data		
Cadmium [ug/L]	APW-03	Insufficient Data		
Cadmium [ug/L]	APW-05/05R	Insufficient Data		
Cadmium [ug/L]	APW-06D	Insufficient Data		
Cadmium [ug/L]	APW-06S	Insufficient Data		
Cadmium [ug/L]	APW-07	Insufficient Data		
Cadmium [ug/L]	APW-08	Insufficient Data		
Cadmium [ug/L]	APW-10D	Insufficient Data		
Cadmium [ug/L]	APW-10S	Insufficient Data		
Calcium [mg/L]	APW-02	Normal		164.3
Calcium [mg/L]	APW-03	Normal		120.2
Calcium [mg/L]	APW-05/05R	Normal		128.2
Calcium [mg/L]	APW-06D	Normal		112.5
Calcium [mg/L]	APW-06S	Normal		102.4
Calcium [mg/L]	APW-07	Normal		201.5
Calcium [mg/L]	APW-08	Normal		96.86
Calcium [mg/L]	APW-10D	No Distribution Detected		236.4
Calcium [mg/L]	APW-10S	Normal		151
Chloride [mg/L]	APW-02	Normal		11.11
Chloride [mg/L]	APW-03	Normal		20.13
Chloride [mg/L]	APW-05/05R	Normal		16.79
Chloride [mg/L]	APW-06D	No Distribution Detected		17.83
Chloride [mg/L]	APW-06S	Normal		26.22
Chloride [mg/L]	APW-07	Normal		14.12
Chloride [mg/L]	APW-08	Normal		11.07
Chloride [mg/L]	APW-10D	Normal		16.83
Chloride [mg/L]	APW-10S	Normal		14.03
Chromium [ug/L]	APW-02	Normal		50.36
Chromium [ug/L]	APW-03	Normal		7.715
Chromium [ug/L]	APW-05/05R	Normal		4.508
Chromium [ug/L]	APW-06D	Lognormal		
Chromium [ug/L]	APW-06S	Normal		4.957
Chromium [ug/L]	APW-07	Lognormal		
Chromium [ug/L]	APW-08	Normal		3.883
Chromium [ug/L]	APW-10D	Gamma		
Chromium [ug/L]	APW-10S	No Distribution Detected		5.213
Cobalt [ug/L]	APW-02	Normal		4.841
Cobalt [ug/L]	APW-03	Normal		1.304
Cobalt [ug/L]	APW-05/05R	Insufficient Data		
Cobalt [ug/L]	APW-06D	Normal		2.32
Cobalt [ug/L]	APW-06S	Insufficient Data		
Cobalt [ug/L]	APW-07	No Distribution Detected		1.068
Cobalt [ug/L]	APW-08	Normal		1.548

Table E4. Summary of Downgradient Confidence Limits
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well	Distribution	95% LCL	95% UCL
Cobalt [ug/L]	APW-10D	Normal		3.795
Cobalt [ug/L]	APW-10S	Normal		1.356
Dissolved Solids, Total [mg/L]	APW-02	Normal		896.4
Dissolved Solids, Total [mg/L]	APW-03	Normal		576.1
Dissolved Solids, Total [mg/L]	APW-05/05R	Normal		775.7
Dissolved Solids, Total [mg/L]	APW-06D	No Distribution Detected		608.7
Dissolved Solids, Total [mg/L]	APW-06S	Normal		613.5
Dissolved Solids, Total [mg/L]	APW-07	Normal		772.2
Dissolved Solids, Total [mg/L]	APW-08	Normal		428.5
Dissolved Solids, Total [mg/L]	APW-10D	Normal		471
Dissolved Solids, Total [mg/L]	APW-10S	Normal		771.1
Fluoride [ug/L]	APW-02	Normal		248.2
Fluoride [ug/L]	APW-03	Normal		281.3
Fluoride [ug/L]	APW-05/05R	Normal		345
Fluoride [ug/L]	APW-06D	Normal		223.8
Fluoride [ug/L]	APW-06S	Normal		302.2
Fluoride [ug/L]	APW-07	No Distribution Detected		216.2
Fluoride [ug/L]	APW-08	Normal		286.6
Fluoride [ug/L]	APW-10D	Normal		116
Fluoride [ug/L]	APW-10S	Normal		173.4
Iron [mg/L]	APW-02	Insufficient Data		
Iron [mg/L]	APW-03	Insufficient Data		
Iron [mg/L]	APW-05/05R	Insufficient Data		
Iron [mg/L]	APW-06D	Insufficient Data		
Iron [mg/L]	APW-06S	Insufficient Data		
Iron [mg/L]	APW-07	Insufficient Data		
Iron [mg/L]	APW-08	Insufficient Data		
Iron [mg/L]	APW-10D	Insufficient Data		
Iron [mg/L]	APW-10S	Insufficient Data		
Lead [ug/L]	APW-02	Normal		10.3
Lead [ug/L]	APW-03	Normal		2.246
Lead [ug/L]	APW-05/05R	Normal		1.406
Lead [ug/L]	APW-06D	No Distribution Detected		1.163
Lead [ug/L]	APW-06S	Insufficient Data		
Lead [ug/L]	APW-07	Insufficient Data		
Lead [ug/L]	APW-08	Normal		1.57
Lead [ug/L]	APW-10D	No Distribution Detected		1.213
Lead [ug/L]	APW-10S	Normal		1.851
Lithium [ug/L]	APW-02	Normal		52.72
Lithium [ug/L]	APW-03	Normal		31.44
Lithium [ug/L]	APW-05/05R	Normal		42.26
Lithium [ug/L]	APW-06D	Normal		17.85
Lithium [ug/L]	APW-06S	No Distribution Detected		43.73
Lithium [ug/L]	APW-07	Normal		18.34

Table E4. Summary of Downgradient Confidence Limits
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well	Distribution	95% LCL	95% UCL
Lithium [ug/L]	APW-08	Normal		19.72
Lithium [ug/L]	APW-10D	Normal		15.52
Lithium [ug/L]	APW-10S	Normal		32.42
Manganese [mg/L]	APW-02	Insufficient Data		
Manganese [mg/L]	APW-03	Insufficient Data		
Manganese [mg/L]	APW-05/05R	Insufficient Data		
Manganese [mg/L]	APW-06D	Insufficient Data		
Manganese [mg/L]	APW-06S	Insufficient Data		
Manganese [mg/L]	APW-07	Insufficient Data		
Manganese [mg/L]	APW-08	Insufficient Data		
Manganese [mg/L]	APW-10D	Insufficient Data		
Manganese [mg/L]	APW-10S	Insufficient Data		
Mercury [ug/L]	APW-02	Insufficient Data		
Mercury [ug/L]	APW-03	Insufficient Data		
Mercury [ug/L]	APW-05/05R	Insufficient Data		
Mercury [ug/L]	APW-06D	Insufficient Data		
Mercury [ug/L]	APW-06S	Insufficient Data		
Mercury [ug/L]	APW-07	Insufficient Data		
Mercury [ug/L]	APW-08	Insufficient Data		
Mercury [ug/L]	APW-10D	Insufficient Data		
Mercury [ug/L]	APW-10S	Insufficient Data		
Molybdenum [ug/L]	APW-02	Normal		183.3
Molybdenum [ug/L]	APW-03	Normal		70
Molybdenum [ug/L]	APW-05/05R	Normal		223.9
Molybdenum [ug/L]	APW-06D	Normal		63.83
Molybdenum [ug/L]	APW-06S	Normal		279.9
Molybdenum [ug/L]	APW-07	Normal		3.683
Molybdenum [ug/L]	APW-08	Normal		1.129
Molybdenum [ug/L]	APW-10D	Insufficient Data		
Molybdenum [ug/L]	APW-10S	Normal		1.345
Nickel [ug/L]	APW-02	Normal		44.04
Nickel [ug/L]	APW-03	Normal		5.051
Nickel [ug/L]	APW-05/05R	Normal		3.812
Nickel [ug/L]	APW-06D	No Distribution Detected		
Nickel [ug/L]	APW-06S	Gamma		
Nickel [ug/L]	APW-07	Normal		5.7
Nickel [ug/L]	APW-08	Normal		5.136
Nickel [ug/L]	APW-10D	Normal		7.293
Nickel [ug/L]	APW-10S	Normal		2.571
pH, Lab [SU]	APW-02	Normal	7.041	7.171
pH, Lab [SU]	APW-03	Normal	7.467	7.679
pH, Lab [SU]	APW-05/05R	Normal	7.277	7.353
pH, Lab [SU]	APW-06D	Normal	7.231	7.359
pH, Lab [SU]	APW-06S	Normal	7.103	7.245

Table E4. Summary of Downgradient Confidence Limits
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well	Distribution	95% LCL	95% UCL
pH, Lab [SU]	APW-07	No Distribution Detected	6.864	6.994
pH, Lab [SU]	APW-08	Normal	7.129	7.288
pH, Lab [SU]	APW-10D	Normal	7.089	7.257
pH, Lab [SU]	APW-10S	No Distribution Detected	6.991	7.136
Radium-226/228 [pCi/L]	APW-02	Normal		2.359
Radium-226/228 [pCi/L]	APW-03	No Distribution Detected		2.215
Radium-226/228 [pCi/L]	APW-05/05R	No Distribution Detected		2.863
Radium-226/228 [pCi/L]	APW-06D	No Distribution Detected		2.112
Radium-226/228 [pCi/L]	APW-06S	No Distribution Detected		2.095
Radium-226/228 [pCi/L]	APW-07	No Distribution Detected		2.1
Radium-226/228 [pCi/L]	APW-08	No Distribution Detected		2.049
Radium-226/228 [pCi/L]	APW-10D	No Distribution Detected		1.971
Radium-226/228 [pCi/L]	APW-10S	No Distribution Detected		2.566
Selenium [ug/L]	APW-02	Insufficient Data		
Selenium [ug/L]	APW-03	No Distribution Detected		1.21
Selenium [ug/L]	APW-05/05R	Insufficient Data		
Selenium [ug/L]	APW-06D	Insufficient Data		
Selenium [ug/L]	APW-06S	Insufficient Data		
Selenium [ug/L]	APW-07	Insufficient Data		
Selenium [ug/L]	APW-08	Normal		14.75
Selenium [ug/L]	APW-10D	Normal		1.945
Selenium [ug/L]	APW-10S	Insufficient Data		
Sulfate [mg/L]	APW-02	Normal		469.1
Sulfate [mg/L]	APW-03	Normal		246.6
Sulfate [mg/L]	APW-05/05R	Normal		390.2
Sulfate [mg/L]	APW-06D	Normal		239.4
Sulfate [mg/L]	APW-06S	Normal		221
Sulfate [mg/L]	APW-07	Normal		63.17
Sulfate [mg/L]	APW-08	Normal		37.68
Sulfate [mg/L]	APW-10D	No Distribution Detected		42.46
Sulfate [mg/L]	APW-10S	No Distribution Detected		8.779
Thallium [ug/L]	APW-02	Insufficient Data		
Thallium [ug/L]	APW-03	Insufficient Data		
Thallium [ug/L]	APW-05/05R	Insufficient Data		
Thallium [ug/L]	APW-06D	Insufficient Data		
Thallium [ug/L]	APW-06S	Insufficient Data		
Thallium [ug/L]	APW-07	Insufficient Data		
Thallium [ug/L]	APW-08	Insufficient Data		
Thallium [ug/L]	APW-10D	Insufficient Data		
Thallium [ug/L]	APW-10S	Insufficient Data		
Turbidity, Field [NTU]	APW-02	Normal		126.7
Turbidity, Field [NTU]	APW-03	Normal		57.7
Turbidity, Field [NTU]	APW-05/05R	Normal		49.79
Turbidity, Field [NTU]	APW-06D	Normal		100.4

Table E4. Summary of Downgradient Confidence Limits
Annual Groundwater Monitoring Report
Grand Tower Energy Center

Analyte	Well	Distribution	95% LCL	95% UCL
Turbidity, Field [NTU]	APW-06S	Normal		16.26
Turbidity, Field [NTU]	APW-07	Normal		52.35
Turbidity, Field [NTU]	APW-08	Normal		193.7
Turbidity, Field [NTU]	APW-10D	Normal		139.8
Turbidity, Field [NTU]	APW-10S	Normal		55.5

Notes:

ug/L = microgram per liter

pCi/L = picocuries per liter

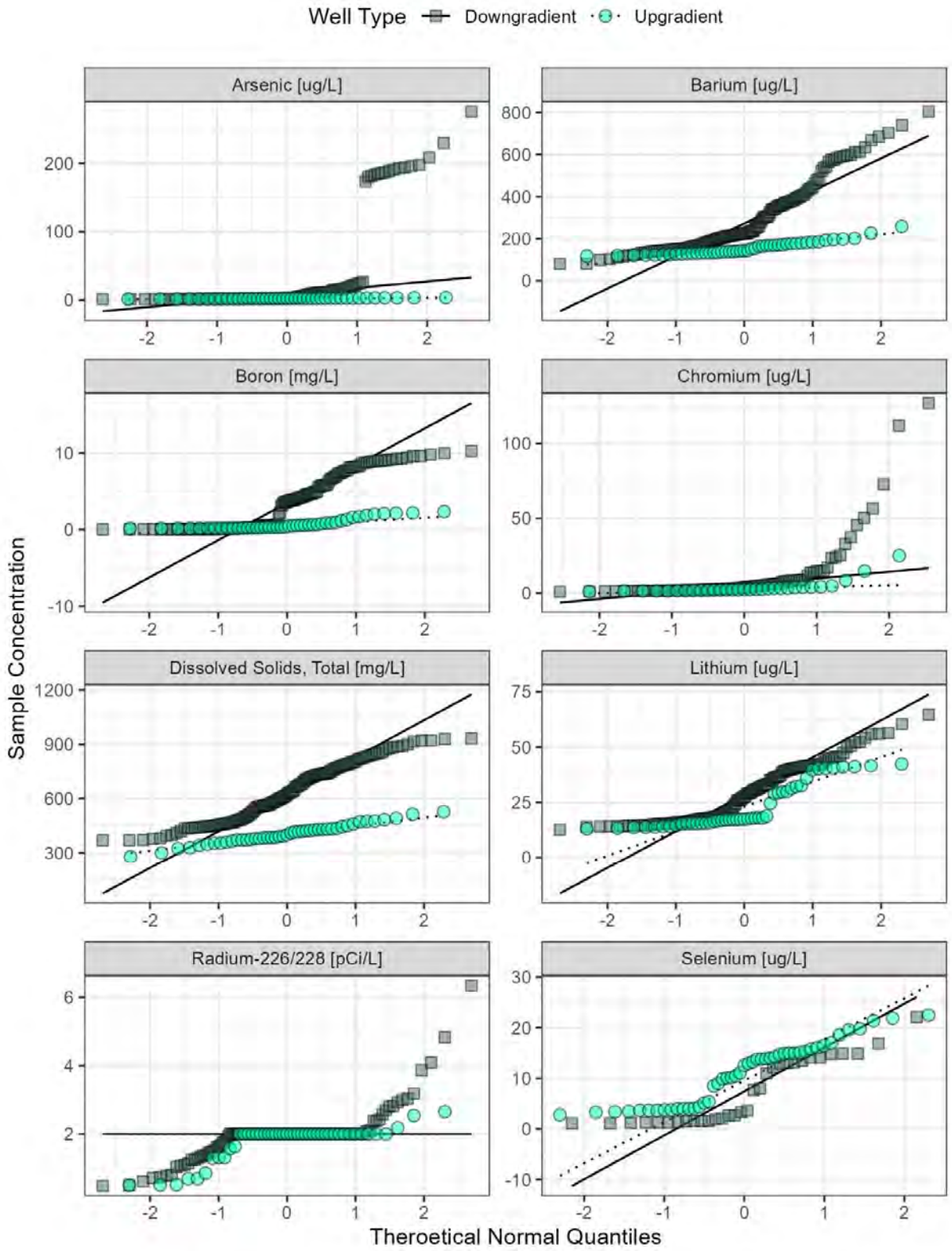
SU = standard units

95% LCL = 95% lower confidence limit of the mean

95% UCL = 95% upper confidence limit of the mean

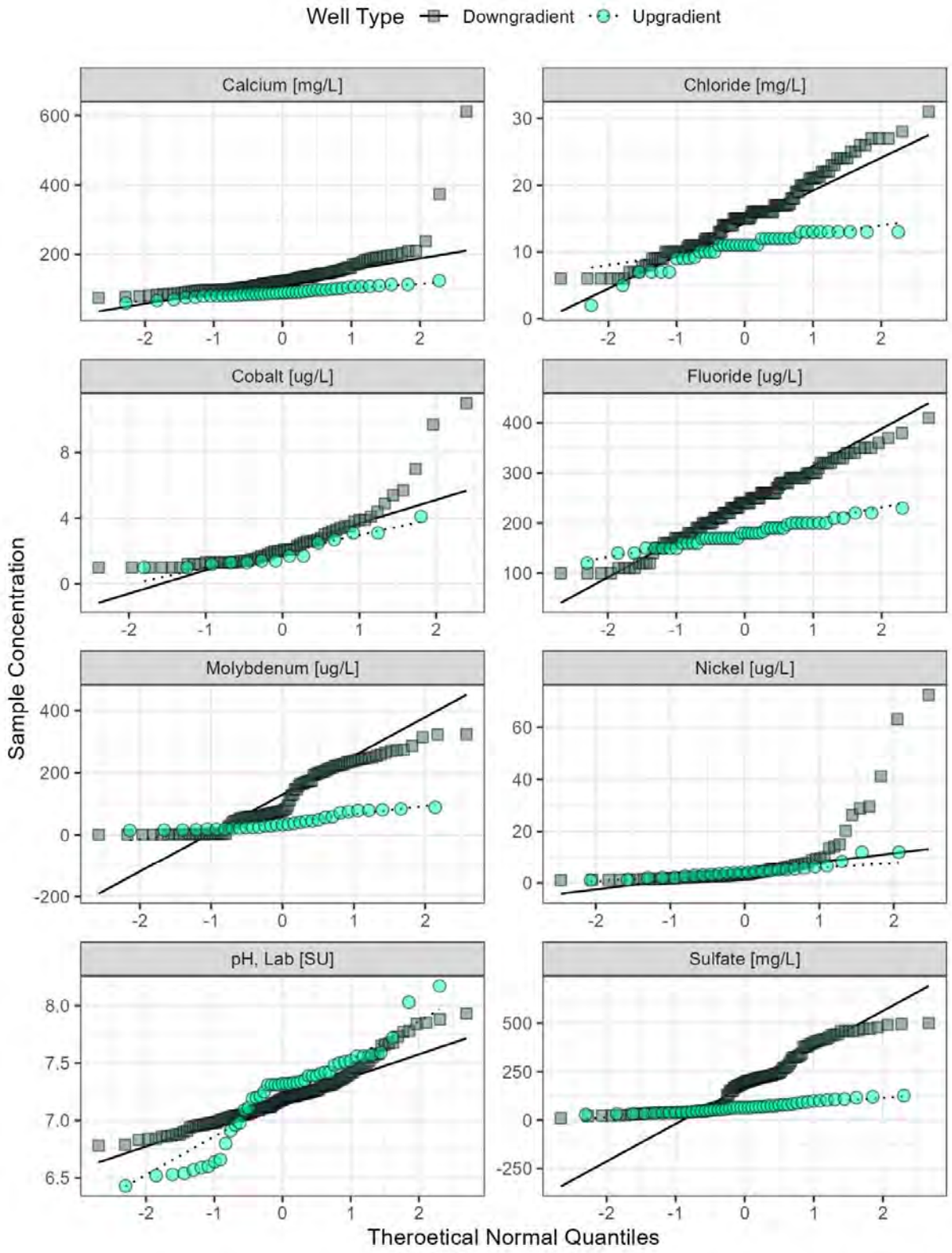
APPENDIX E2. FIGURES

Figure E1. Summary of Analyte Detections by Well.



Note: This figure shows detected values only; groups with fewer than 5 detections are not shown.

Figure E2-A. Probability Plots.



Note: This figure shows detected values only; groups with fewer than 5 detections are not shown.

Figure E2-B. Probability Plots.

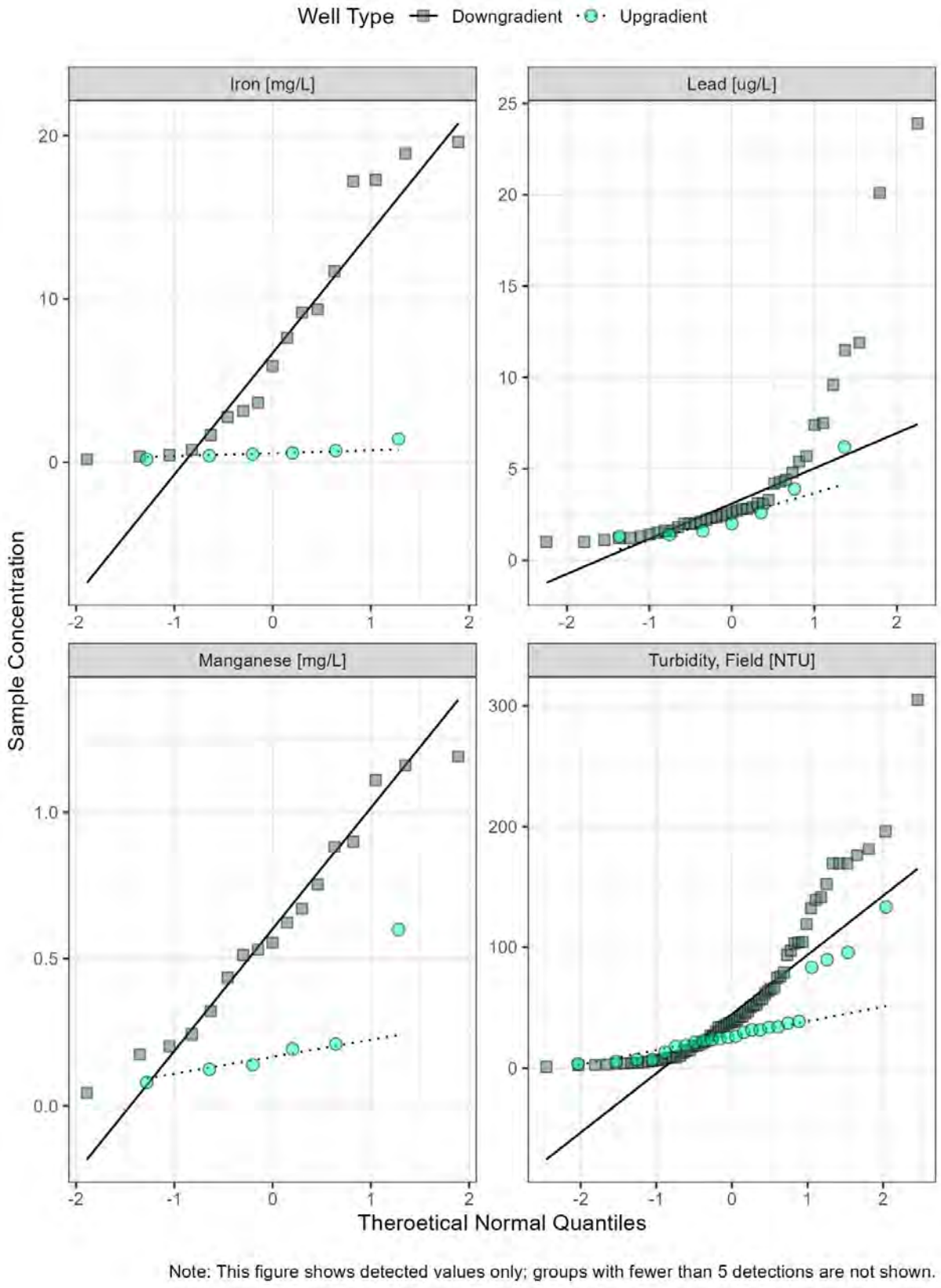


Figure E2-C. Probability Plots.

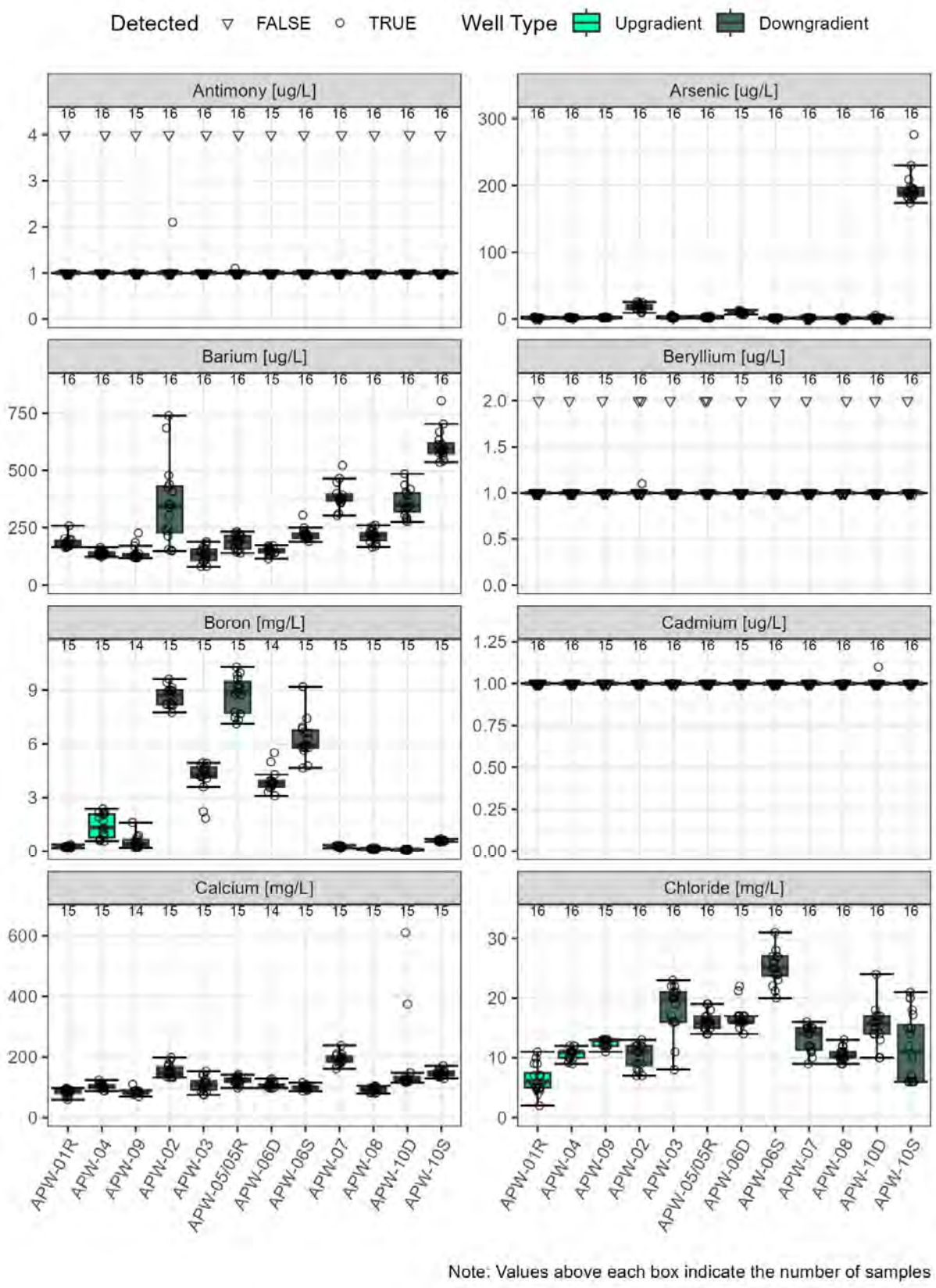


Figure E3-A. Box Plots.

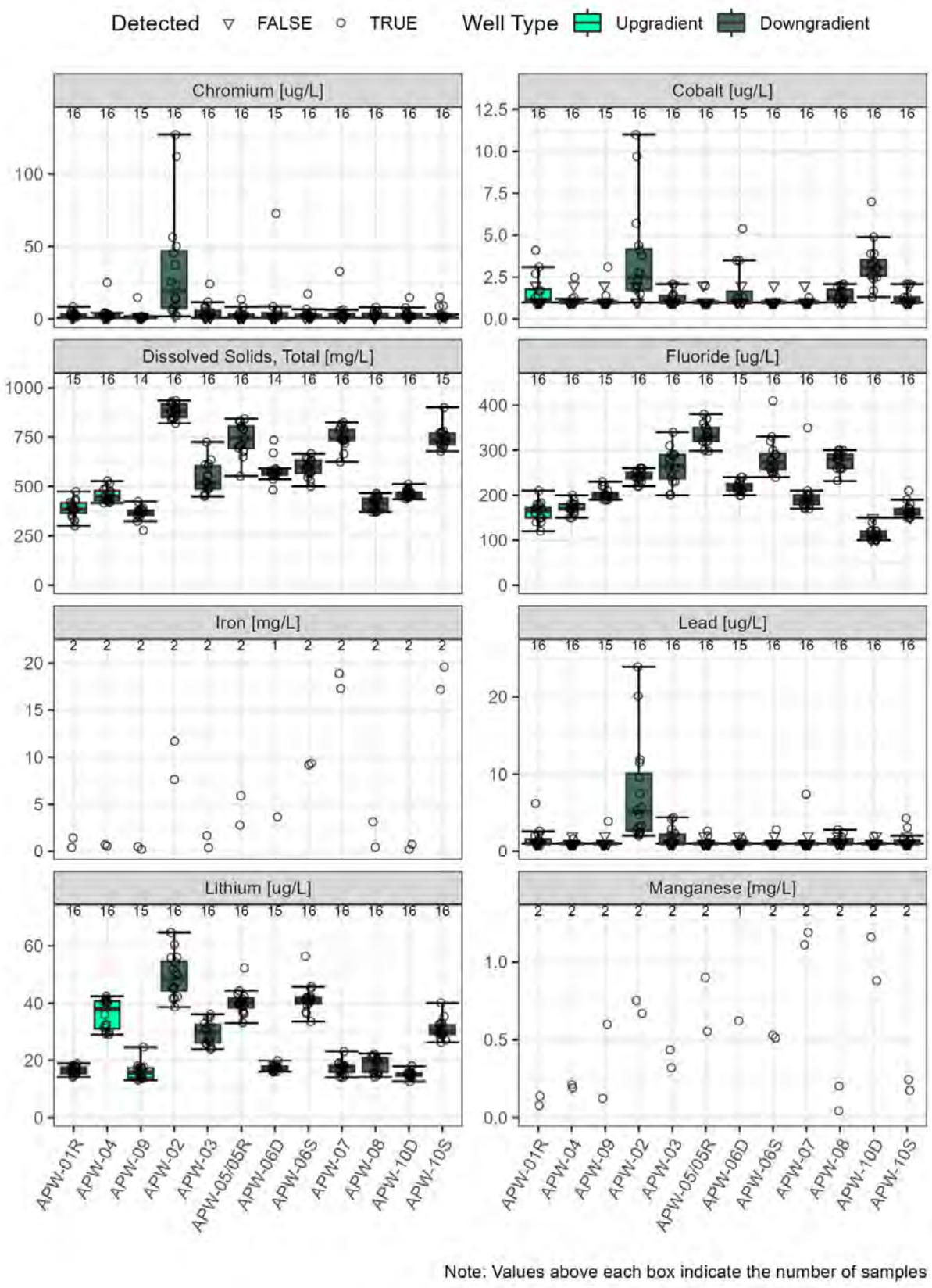


Figure E3-B. Box Plots.

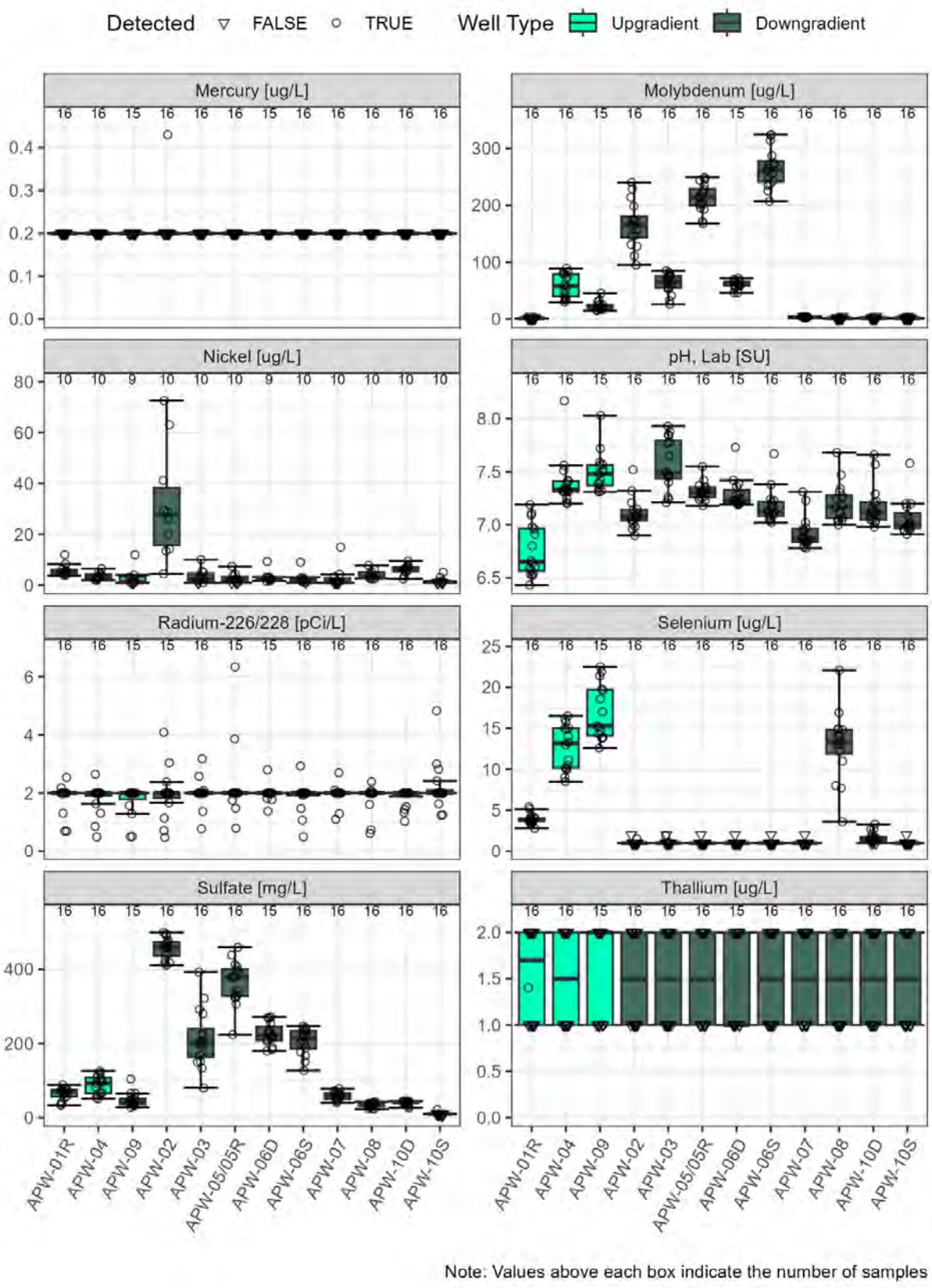


Figure E3-C. Box Plots.

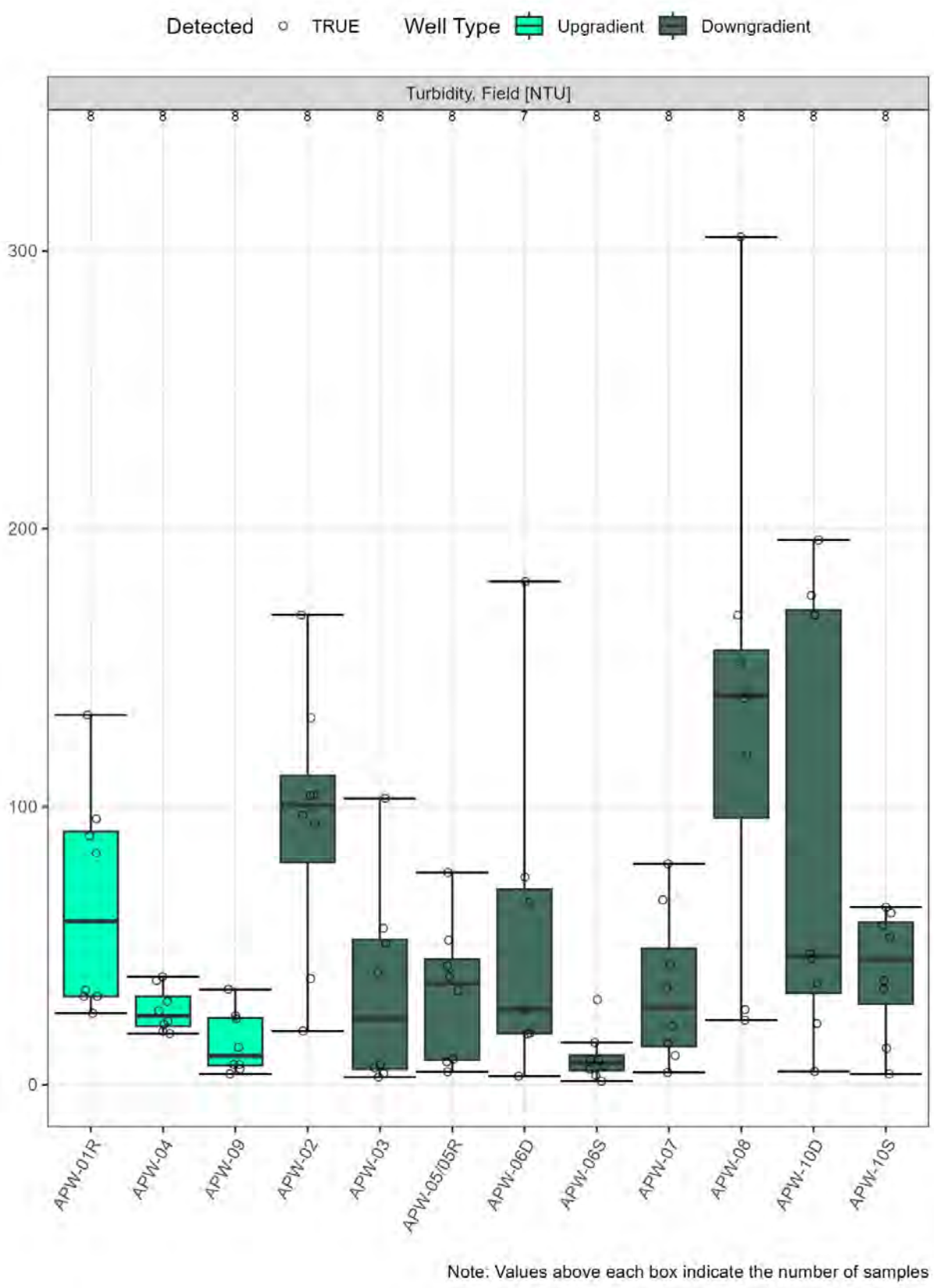


Figure E3-D. Box Plots.

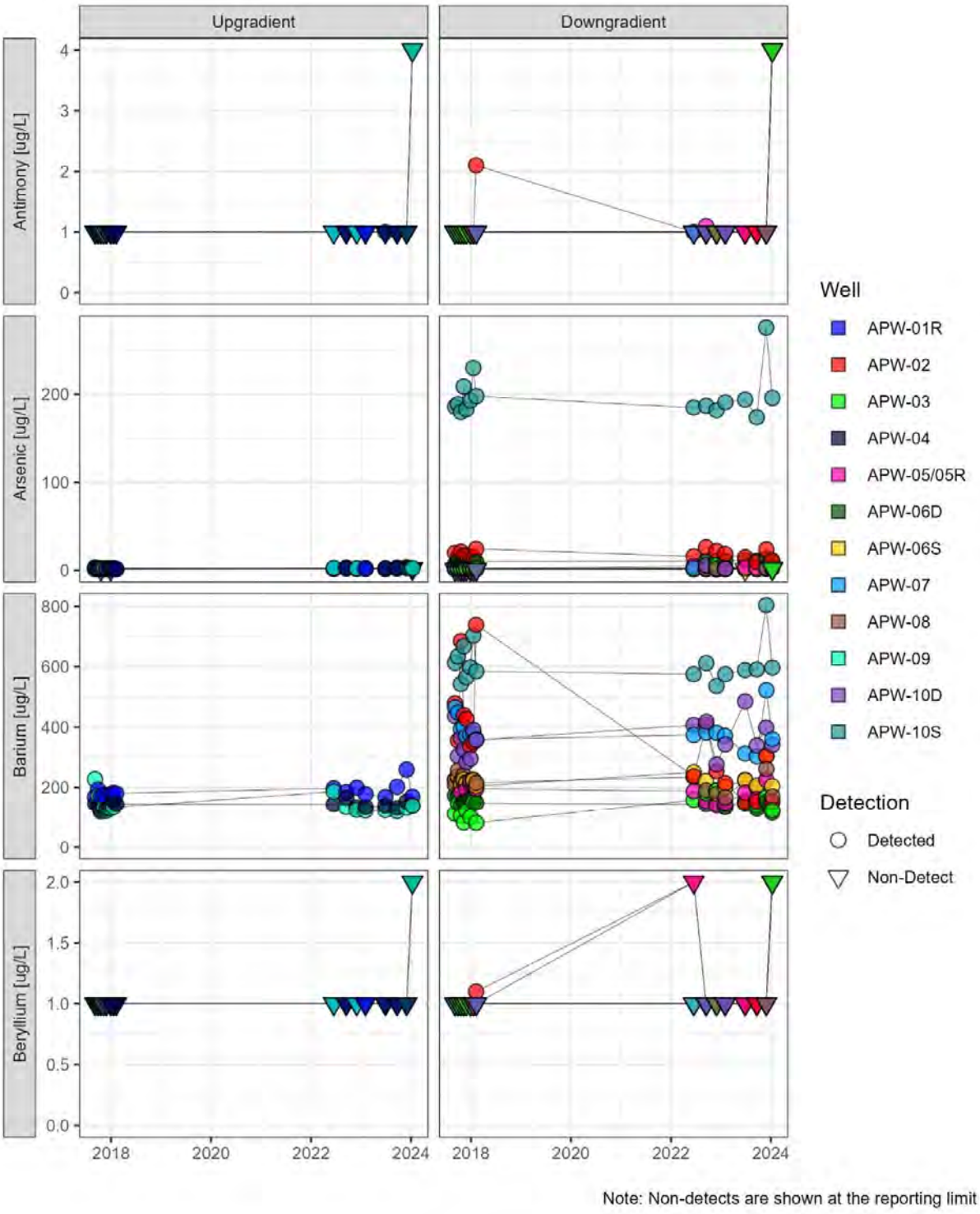


Figure E4-A. Time Series Figures.

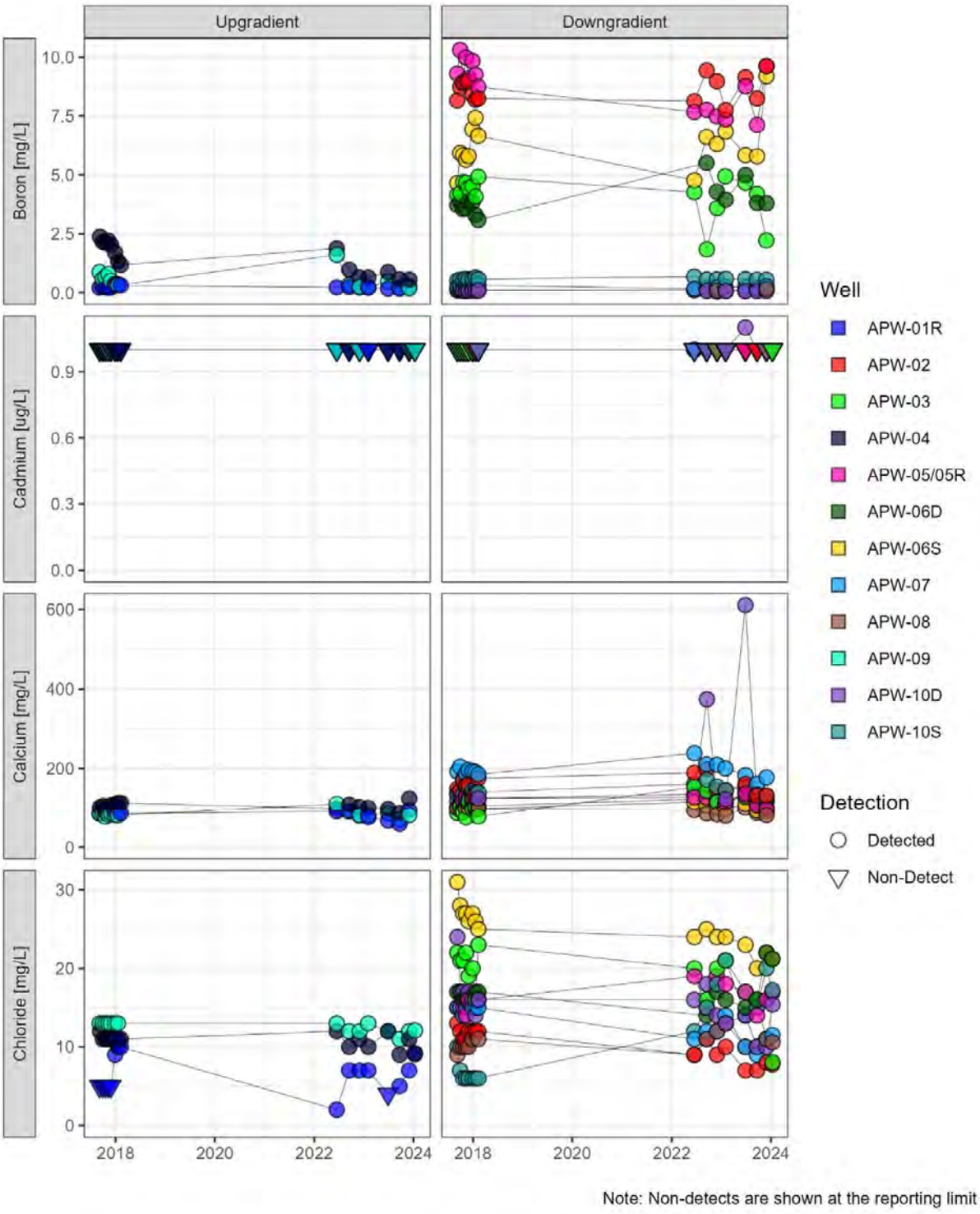


Figure E4-B. Time Series Figures.

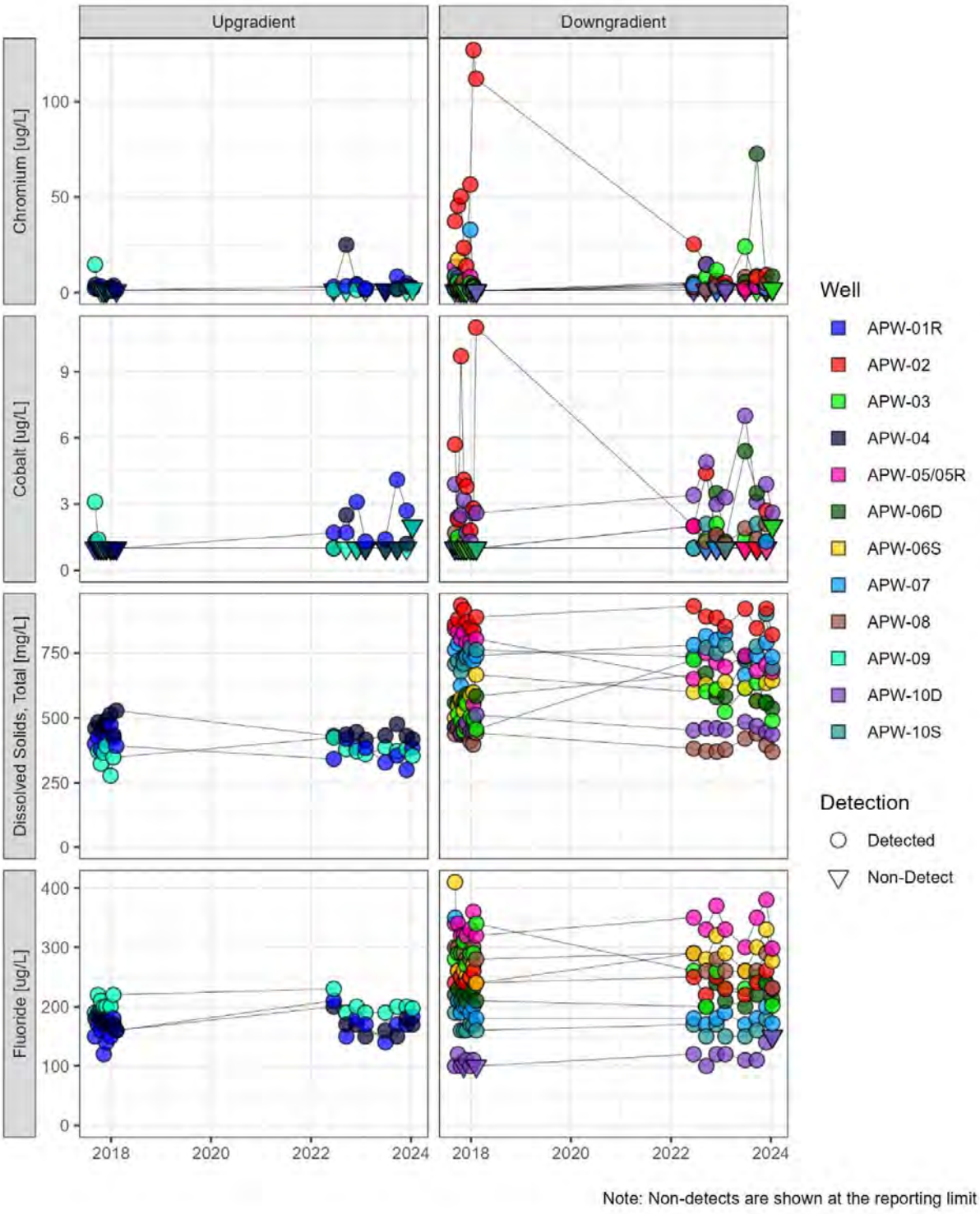


Figure E4-C. Time Series Figures.

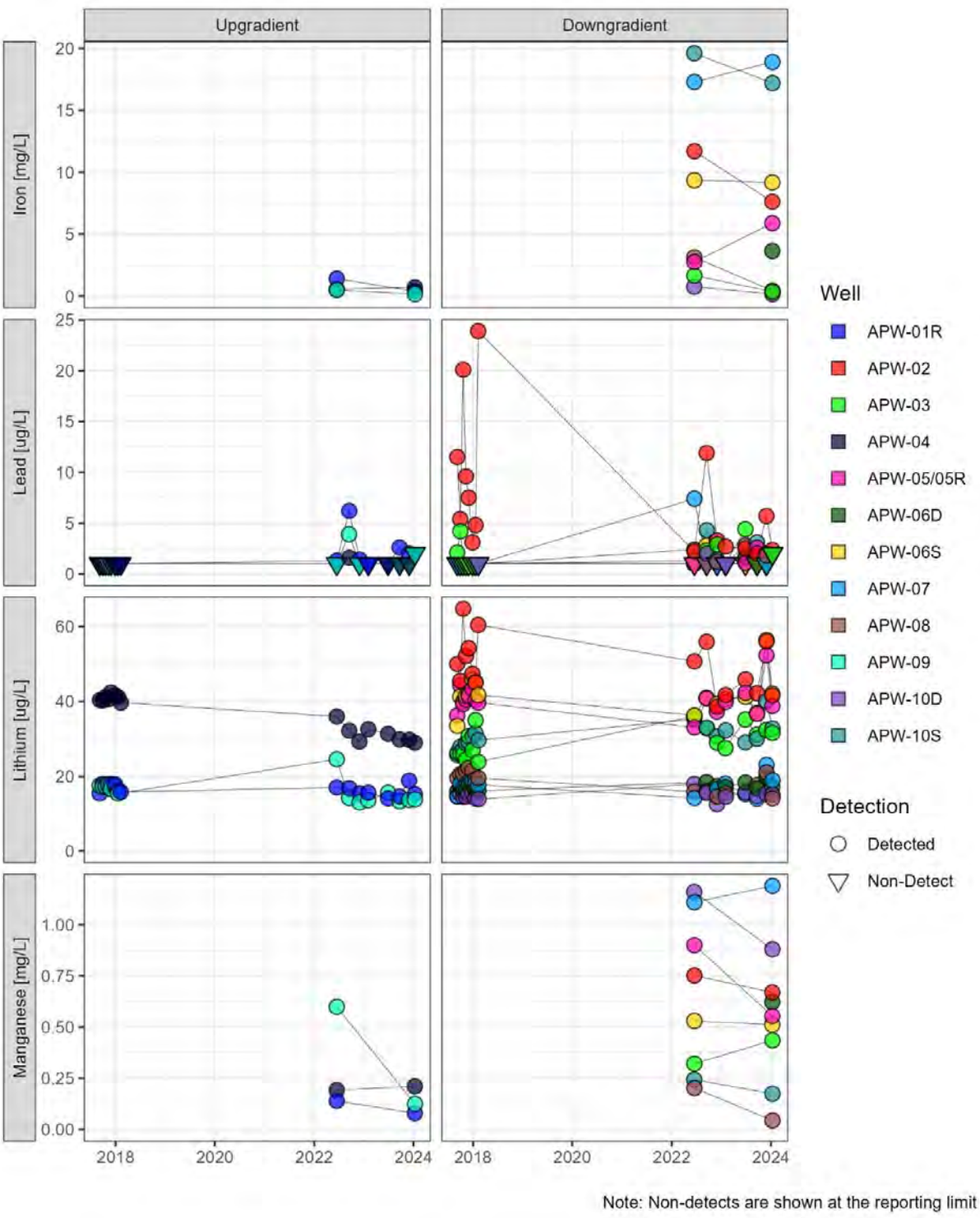


Figure E4-D. Time Series Figures.

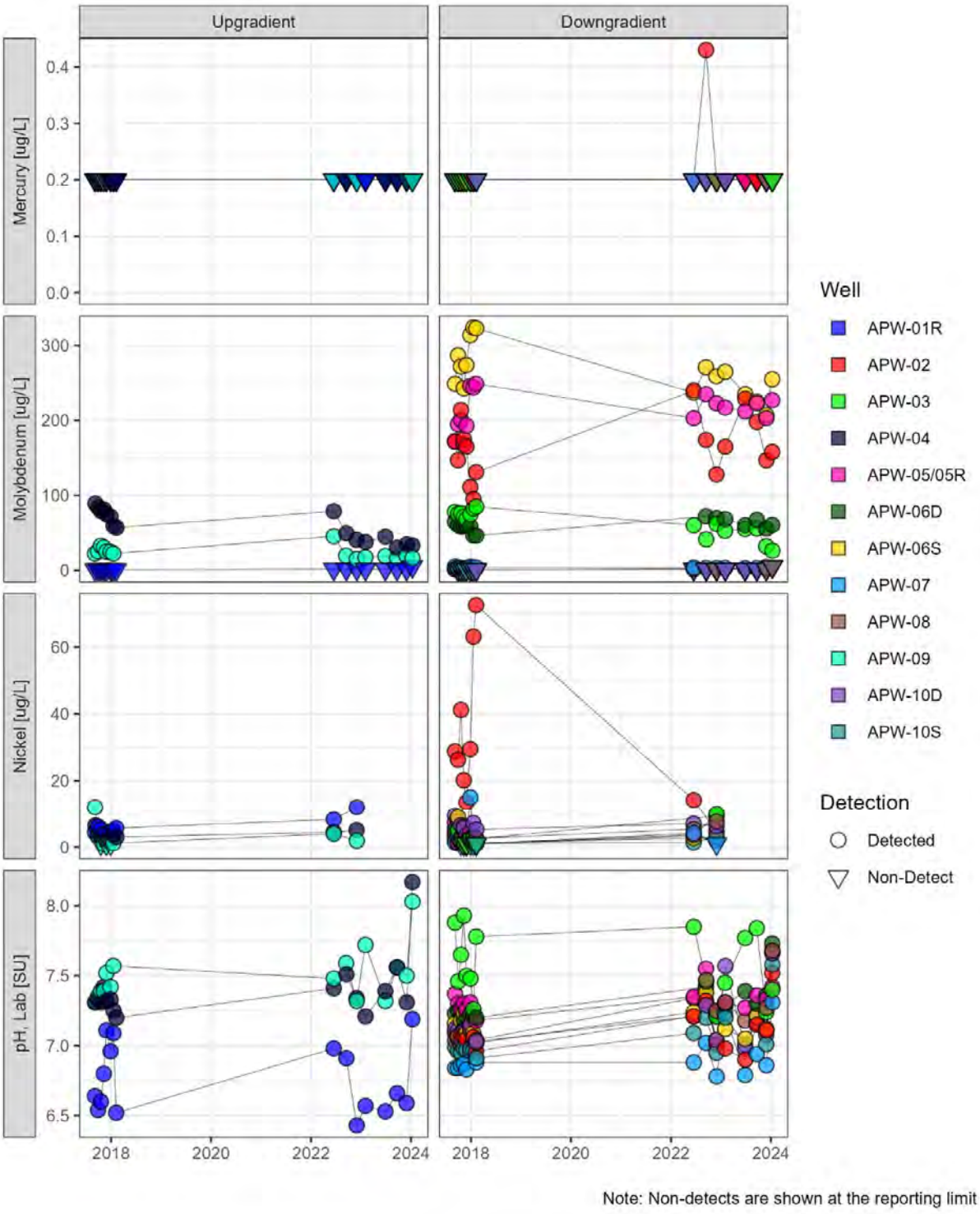


Figure E4-E. Time Series Figures.

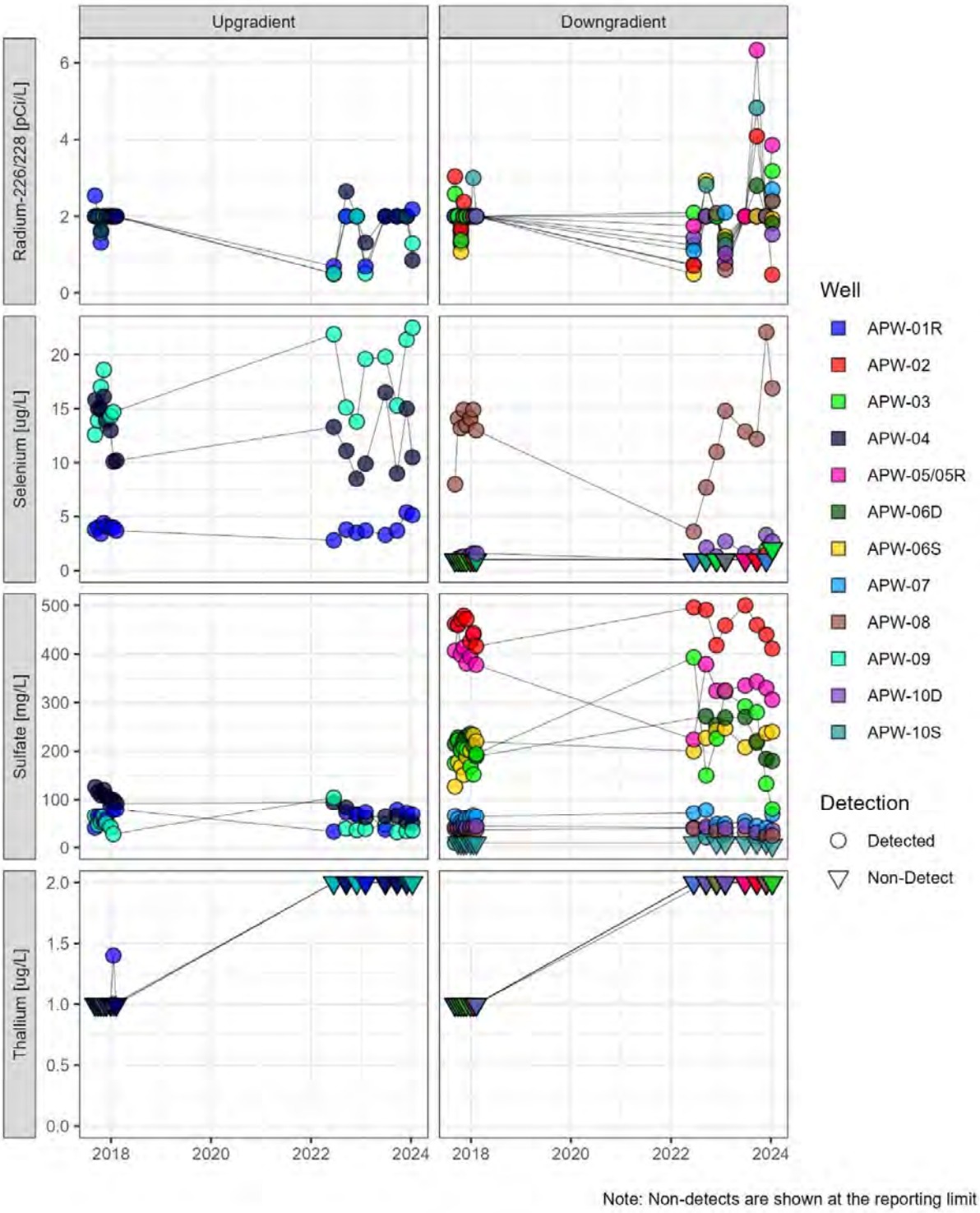


Figure E4-F. Time Series Figures.

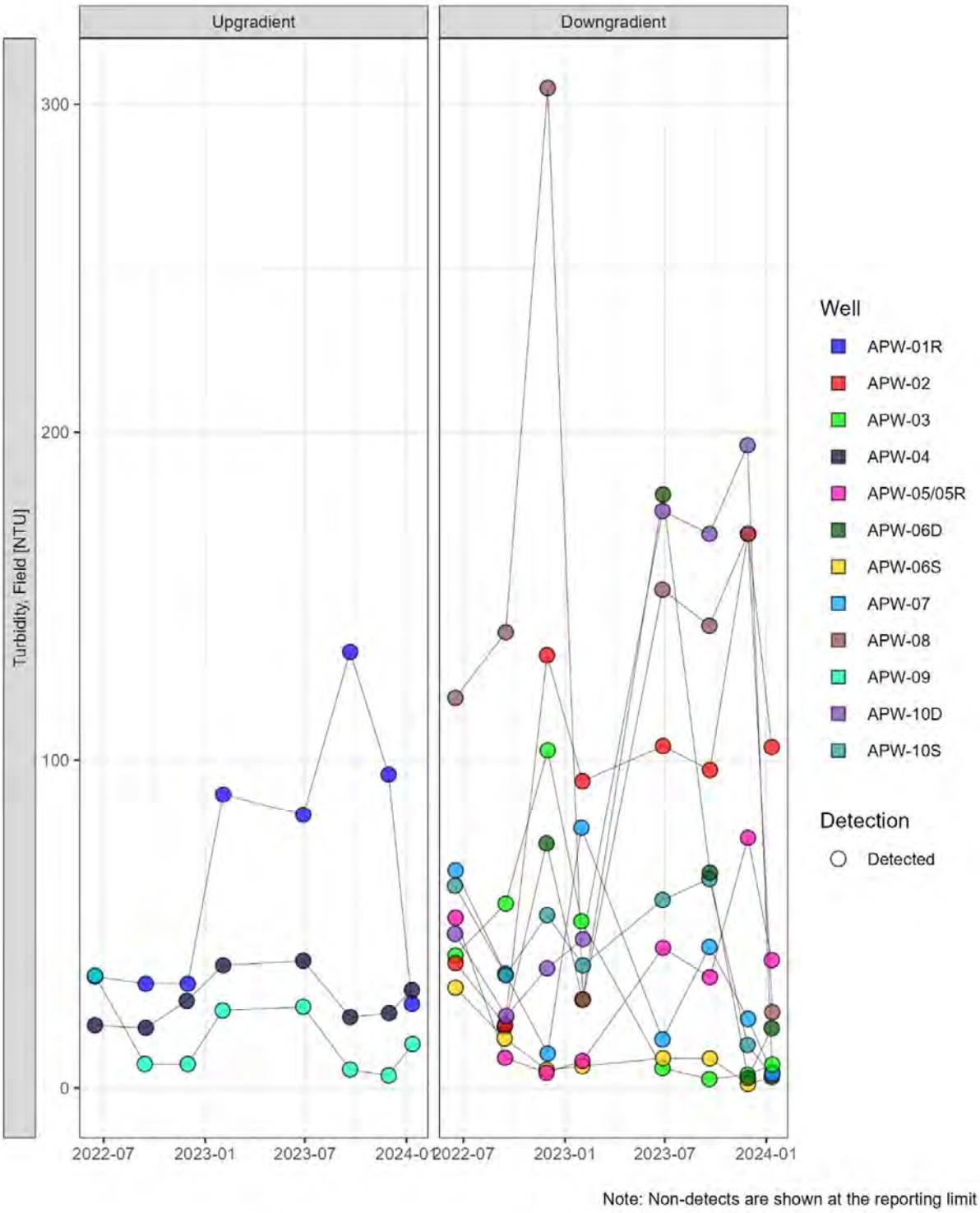


Figure E4-G. Time Series Figures.

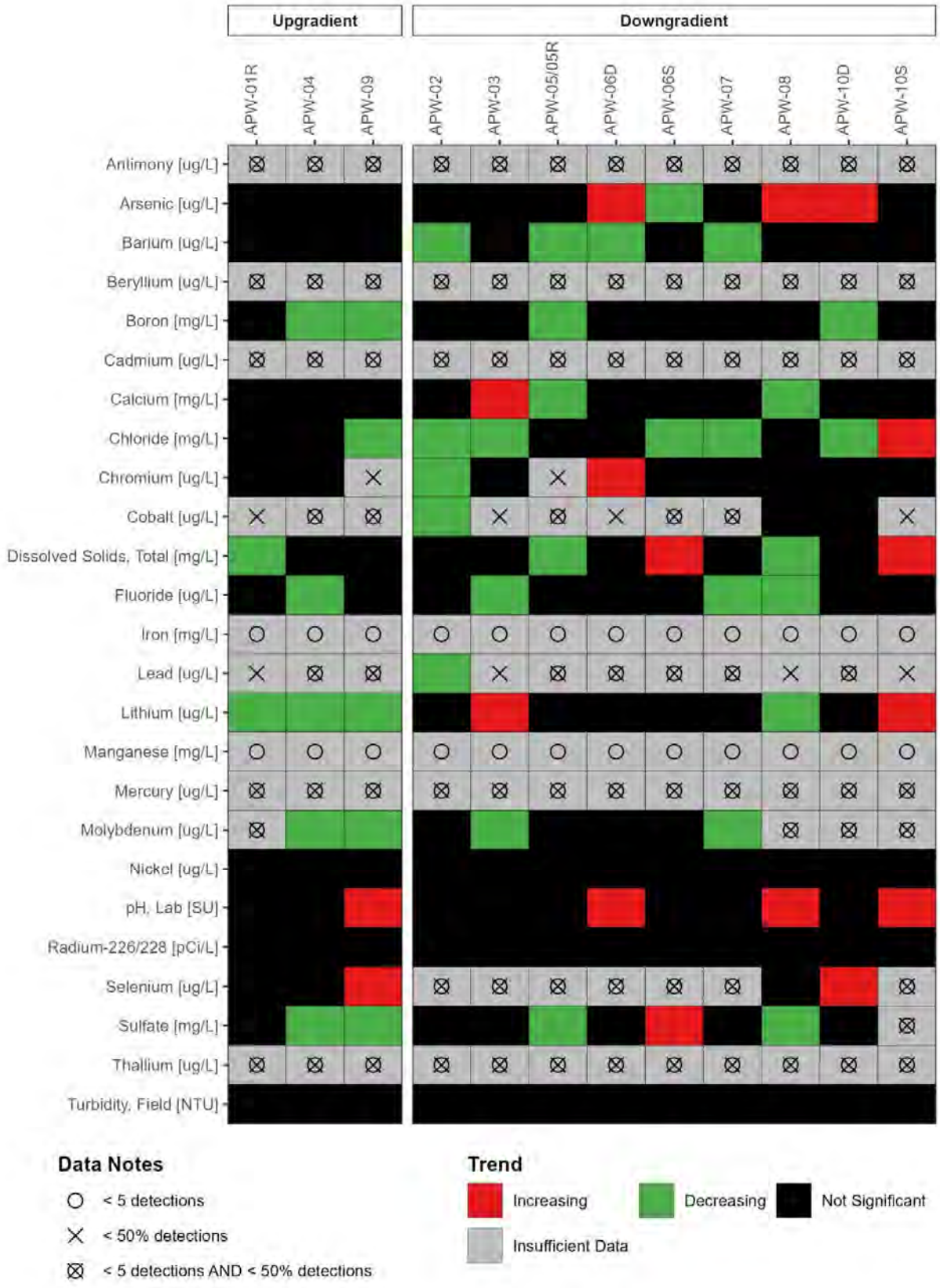


Figure E5. Trend Analysis Summary.

Figure E6. Summary of Background Concentration or Groundwater Protection Standard Exceedances.

APPENDIX E3. PROUCL INPUT AND OUTPUT

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

x_ols (antimony [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	2		
Number of Detects	1	Number of Non-Detects	46
Number of Distinct Detects	1	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	1	Maximum Non-Detect	4
Variance Detected	N/A	Percent Non-Detects	97.87%
Mean Detected	1	SD Detected	N/A
Mean of Detected Logged Data	0	SD of Detected Logged Data	N/A

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 x_ols (antimony [ug/l]_interwell_pooled-upgradient) was not processed!

x_ols (arsenic [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	21		
Number of Detects	43	Number of Non-Detects	4
Number of Distinct Detects	20	Number of Distinct Non-Detects	2
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	3.3	Maximum Non-Detect	2
Variance Detected	0.324	Percent Non-Detects	8.511%
Mean Detected	1.964	SD Detected	0.569
Mean of Detected Logged Data	0.633	SD of Detected Logged Data	0.296

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.923	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.0875	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.156	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	1.902	KM SD	0.583
95% UTL95% Coverage	3.11	95% KM UPL (t)	2.89
90% KM Percentile (z)	2.649	95% KM Percentile (z)	2.86
99% KM Percentile (z)	3.257	95% KM USL	3.611

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	1.861	SD	0.647
95% UTL95% Coverage	3.203	95% UPL (t)	2.958
90% Percentile (z)	2.69	95% Percentile (z)	2.925

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

99% Percentile (z)	3.366	95% USL	3.758

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.258	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.748	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0718	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.135	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	12.09	k star (bias corrected MLE)	11.26
Theta hat (MLE)	0.162	Theta star (bias corrected MLE)	0.174
nu hat (MLE)	1040	nu star (bias corrected)	968.8
MLE Mean (bias corrected)	1.964		
MLE Sd (bias corrected)	0.585	95% Percentile of Chisquare (2kstar)	34.59

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	0.767	Mean	1.895
Maximum	3.3	Median	1.9
SD	0.599	CV	0.316
k hat (MLE)	9.816	k star (bias corrected MLE)	9.204
Theta hat (MLE)	0.193	Theta star (bias corrected MLE)	0.206
nu hat (MLE)	922.7	nu star (bias corrected)	865.2
MLE Mean (bias corrected)	1.895	MLE Sd (bias corrected)	0.625
95% Percentile of Chisquare (2kstar)	29.39	90% Percentile	2.727
95% Percentile	3.026	99% Percentile	3.642

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	3.372	3.418	95% Approx. Gamma UPL	3.045	3.07
95% Gamma USL	4.204	4.318			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.902	SD (KM)	0.583
Variance (KM)	0.339	SE of Mean (KM)	0.0865
k hat (KM)	10.66	k star (KM)	9.995
nu hat (KM)	1002	nu star (KM)	939.5
theta hat (KM)	0.178	theta star (KM)	0.19
80% gamma percentile (KM)	2.381	90% gamma percentile (KM)	2.702
95% gamma percentile (KM)	2.988	99% gamma percentile (KM)	3.573

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	3.307	3.344	95% Approx. Gamma UPL	2.998	3.017
95% KM Gamma Percentile	2.957	2.975	95% Gamma USL	4.09	4.185

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.951	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0756	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.123	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	1.899	Mean in Log Scale	0.592
SD in Original Scale	0.592	SD in Log Scale	0.322
95% UTL95% Coverage	3.526	95% BCA UTL95% Coverage	3.1
95% Bootstrap (%) UTL95% Coverage	3.24	95% UPL (t)	3.122
90% Percentile (z)	2.732	95% Percentile (z)	3.071
99% Percentile (z)	3.825	95% USL	4.65

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.595	95% KM UTL (Lognormal)95% Coverage	3.479
KM SD of Logged Data	0.314	95% KM UPL (Lognormal)	3.09
95% KM Percentile Lognormal (z)	3.04	95% KM USL (Lognormal)	4.557

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	1.861	Mean in Log Scale	0.55
SD in Original Scale	0.647	SD in Log Scale	0.408
95% UTL95% Coverage	4.042	95% UPL (t)	3.465
90% Percentile (z)	2.924	95% Percentile (z)	3.392
99% Percentile (z)	4.481	95% USL	5.74

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	3.3
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	3.02
95% USL	3.3	95% KM Chebyshev UPL	4.468

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (barium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	36
Minimum	118	First Quartile	132
Second Largest	227	Median	144
Maximum	259	Third Quartile	177
Mean	155.8	SD	31.03
Coefficient of Variation	0.199	Skewness	1.092
Mean of logged Data	5.031	SD of logged Data	0.187

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.928	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.168	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.15	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	220.1	90% Percentile (z)	195.5
	95% UPL (t)	208.4	95% Percentile (z)	206.8
	95% USL	246.8	99% Percentile (z)	228

Gamma GOF Test

A-D Test Statistic	1.145	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.155	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.129	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	28.19	k star (bias corrected MLE)	26.4
Theta hat (MLE)	5.526	Theta star (bias corrected MLE)	5.9
nu hat (MLE)	2650	nu star (bias corrected)	2482
MLE Mean (bias corrected)	155.8	MLE Sd (bias corrected)	30.31

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	209.4	90% Percentile	195.7
95% Hawkins Wixley (HW) Approx. Gamma UPL	209.6	95% Percentile	208.8
95% WH Approx. Gamma UTL with 95% Coverage	223.3	99% Percentile	234.8
95% HW Approx. Gamma UTL with 95% Coverage	223.9		
95% WH USL	257.3	95% HW USL	259.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.954	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.145	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.118	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	225.7	90% Percentile (z)	194.6
	95% UPL (t)	210.3	95% Percentile (z)	208.3
	95% USL	265.1	99% Percentile (z)	236.6

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	47	95% UTL with	95% Coverage	259

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Approx, f used to compute achieved CC		2.474	Approximate Actual Confidence Coefficient achieved by UTL		0.91
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	249.4	95% BCA Bootstrap UTL with	95% Coverage	241.9
	95% UPL	217		90% Percentile	194.6
	90% Chebyshev UPL	249.9		95% Percentile	201.1
	95% Chebyshev UPL	292.5		99% Percentile	244.3
	95% USL	259			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (beryllium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	2		
Number of Detects	0	Number of Non-Detects	47
Number of Distinct Detects	0	Number of Distinct Non-Detects	2
Minimum Detect	N/A	Minimum Non-Detect	1
Maximum Detect	N/A	Maximum Non-Detect	2
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

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 x_ols (beryllium [ug/l]_interwell_pooled-upgradient) was not processed!

x_ols (boron [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	44
Minimum	0.025	First Quartile	0.216
Second Largest	1.562	Median	0.309
Maximum	1.586	Third Quartile	0.567
Mean	0.455	SD	0.358
Coefficient of Variation	0.787	Skewness	1.662
Mean of logged Data	-1.057	SD of logged Data	0.77

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.091	d2max (for USL)	2.906

Normal GOF Test

Shapiro Wilk Test Statistic	0.811	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.924	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.19	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.154	Data Not Normal at 1% Significance Level	

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.205	90% Percentile (z)	0.915
	95% UPL (t)	1.065	95% Percentile (z)	1.045
	95% USL	1.497	99% Percentile (z)	1.289

Gamma GOF Test

A-D Test Statistic	1.061	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.76	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.134	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.135	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.001	k star (bias corrected MLE)	1.88
Theta hat (MLE)	0.228	Theta star (bias corrected MLE)	0.242
nu hat (MLE)	176.1	nu star (bias corrected)	165.4
MLE Mean (bias corrected)	0.455	MLE Sd (bias corrected)	0.332

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.109	90% Percentile	0.899
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.133	95% Percentile	1.102
95% WH Approx. Gamma UTL with 95% Coverage	1.354	99% Percentile	1.553
95% HW Approx. Gamma UTL with 95% Coverage	1.408		
95% WH USL	1.976	95% HW USL	2.14

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.952	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.115	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.122	Data appear Lognormal at 10% Significance Level	

Data appear Approximate Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	1.739	90% Percentile (z)	0.932
	95% UPL (t)	1.287	95% Percentile (z)	1.233
	95% USL	3.258	99% Percentile (z)	2.084

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order		44	95% UTL with 95% Coverage	1.586
Approx, f used to compute achieved CC		2.316	Approximate Actual Confidence Coefficient achieved by UTL	0.895
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	1.583	95% BCA Bootstrap UTL with 95% Coverage	1.562
	95% UPL	1.451	90% Percentile	0.91
	90% Chebyshev UPL	1.543	95% Percentile	1.098
	95% Chebyshev UPL	2.036	99% Percentile	1.576
	95% USL	1.586		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (cadmium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	1		
Number of Detects	0	Number of Non-Detects	47
Number of Distinct Detects	0	Number of Distinct Non-Detects	1
Minimum Detect	N/A	Minimum Non-Detect	1
Maximum Detect	N/A	Maximum Non-Detect	1
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

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 x_ols (cadmium [ug/l]_interwell_pooled-upgradient) was not processed!

x_ols (calcium [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	44	Number of Distinct Observations	40
Minimum	59.2	First Quartile	81.8
Second Largest	113	Median	89.45
Maximum	124	Third Quartile	98.35
Mean	90.88	SD	13.09
Coefficient of Variation	0.144	Skewness	0.162
Mean of logged Data	4.499	SD of logged Data	0.146

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.091	d2max (for USL)	2.906

Normal GOF Test

Shapiro Wilk Test Statistic	0.986	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.924	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.0978	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.154	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	118.3	90% Percentile (z)	107.7
	95% UPL (t)	113.1	95% Percentile (z)	112.4
	95% USL	128.9	99% Percentile (z)	121.3

Gamma GOF Test

A-D Test Statistic	0.267	**Anderson-Darling Gamma GOF Test**

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0849	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.133	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	48.58	k star (bias corrected MLE)	45.28
Theta hat (MLE)	1.871	Theta star (bias corrected MLE)	2.007
nu hat (MLE)	4275	nu star (bias corrected)	3985
MLE Mean (bias corrected)	90.88	MLE Sd (bias corrected)	13.51

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	114.5	90% Percentile	108.6
95% Hawkins Wixley (HW) Approx. Gamma UPL	114.7	95% Percentile	114.2
95% WH Approx. Gamma UTL with 95% Coverage	120.6	99% Percentile	125.2
95% HW Approx. Gamma UTL with 95% Coverage	121		
95% WH USL	134	95% HW USL	134.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.982	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.952	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0909	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.122	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	122.2	90% Percentile (z)	108.5
95% UPL (t)	115.4	95% Percentile (z)	114.5
95% USL	137.7	99% Percentile (z)	126.5

Nonparametric Distribution Free Background Statistics
Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	44	95% UTL with 95% Coverage	124
Approx, f used to compute achieved CC	2.316	Approximate Actual Confidence Coefficient achieved by UTL	0.895
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	122.4	95% BCA Bootstrap UTL with 95% Coverage	122.4
95% UPL	113	90% Percentile	107.7
90% Chebyshev UPL	130.6	95% Percentile	112.6
95% Chebyshev UPL	148.6	99% Percentile	119.3
95% USL	124		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (chloride [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Number of Distinct Observations	25		
Number of Detects	41	Number of Non-Detects	6
Number of Distinct Detects	24	Number of Distinct Non-Detects	2
Minimum Detect	2	Minimum Non-Detect	4
Maximum Detect	12.84	Maximum Non-Detect	5
Variance Detected	5.126	Percent Non-Detects	12.77%
Mean Detected	10.39	SD Detected	2.264
Mean of Detected Logged Data	2.303	SD of Detected Logged Data	0.328

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.79	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.92	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.16	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	9.322	KM SD	3.494
95% UTL95% Coverage	16.57	95% KM UPL (t)	15.25
90% KM Percentile (z)	13.8	95% KM Percentile (z)	15.07
99% KM Percentile (z)	17.45	95% KM USL	19.57

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	9.375	SD	3.421
95% UTL95% Coverage	16.47	95% UPL (t)	15.18
90% Percentile (z)	13.76	95% Percentile (z)	15
99% Percentile (z)	17.33	95% USL	19.41

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.066	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.269	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.138	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	13.11	k star (bias corrected MLE)	12.17
Theta hat (MLE)	0.793	Theta star (bias corrected MLE)	0.854
nu hat (MLE)	1075	nu star (bias corrected)	997.6
MLE Mean (bias corrected)	10.39		
MLE Sd (bias corrected)	2.98	95% Percentile of Chisquare (2kstar)	36.83

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	2	Mean	9.965

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Maximum	12.84	Median	11
SD	2.401	CV	0.241
k hat (MLE)	12.18	k star (bias corrected MLE)	11.41
Theta hat (MLE)	0.818	Theta star (bias corrected MLE)	0.873
nu hat (MLE)	1145	nu star (bias corrected)	1073
MLE Mean (bias corrected)	9.965	MLE Sd (bias corrected)	2.95
95% Percentile of Chisquare (2kstar)	34.95	90% Percentile	13.88
95% Percentile	15.26	99% Percentile	18.07

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	16.81	17.22	95% Approx. Gamma UPL	15.32	15.6
95% Gamma USL	20.55	21.37			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.322	SD (KM)	3.494
Variance (KM)	12.21	SE of Mean (KM)	0.516
k hat (KM)	7.118	k star (KM)	6.678
nu hat (KM)	669.1	nu star (KM)	627.7
theta hat (KM)	1.31	theta star (KM)	1.396
80% gamma percentile (KM)	12.15	90% gamma percentile (KM)	14.14
95% gamma percentile (KM)	15.94	99% gamma percentile (KM)	19.69

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	21.62	22.91	95% Approx. Gamma UPL	18.65	19.46
95% KM Gamma Percentile	18.27	19.02	95% Gamma USL	29.52	32.44

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.624	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.95	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.126	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	9.832	Mean in Log Scale	2.237
SD in Original Scale	2.586	SD in Log Scale	0.353
95% UTL95% Coverage	19.47	95% BCA UTL95% Coverage	12.74
95% Bootstrap (%) UTL95% Coverage	12.81	95% UPL (t)	17.04
90% Percentile (z)	14.72	95% Percentile (z)	16.74
99% Percentile (z)	21.29	95% USL	26.37

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.097	95% KM UTL (Lognormal)95% Coverage	29.25
KM SD of Logged Data	0.617	95% KM UPL (Lognormal)	23.17
95% KM Percentile Lognormal (z)	22.45	95% KM USL (Lognormal)	49.66

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	9.375	Mean in Log Scale	2.121
SD in Original Scale	3.421	SD in Log Scale	0.57
95% UTL95% Coverage	27.2	95% UPL (t)	21.94

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

90% Percentile (z)	17.32	95% Percentile (z)	21.3
99% Percentile (z)	31.42	95% USL	44.39

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	12.84
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	12.48
95% USL	12.84	95% KM Chebyshev UPL	24.71

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (chromium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	24		
Number of Detects	31	Number of Non-Detects	16
Number of Distinct Detects	22	Number of Distinct Non-Detects	3
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	25.1	Maximum Non-Detect	2
Variance Detected	22.29	Percent Non-Detects	34.04%
Mean Detected	3.856	SD Detected	4.722
Mean of Detected Logged Data	1.035	SD of Detected Logged Data	0.679

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.512	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.902	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.334	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.182	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	2.891	KM SD	4.005
95% UTL95% Coverage	11.2	95% KM UPL (t)	9.685
90% KM Percentile (z)	8.023	95% KM Percentile (z)	9.478
99% KM Percentile (z)	12.21	95% KM USL	14.64

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	2.762	SD	4.113
95% UTL95% Coverage	11.29	95% UPL (t)	9.74
90% Percentile (z)	8.033	95% Percentile (z)	9.527
99% Percentile (z)	12.33	95% USL	14.82

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.582	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.216	**Kolmogorov-Smirnov GOF**
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 on Detected Data Only

k hat (MLE)	1.736	k star (bias corrected MLE)	1.589
Theta hat (MLE)	2.222	Theta star (bias corrected MLE)	2.426
nu hat (MLE)	107.6	nu star (bias corrected)	98.54
MLE Mean (bias corrected)	3.856		
MLE Sd (bias corrected)	3.059	95% Percentile of Chisquare (2kstar)	8.122

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	2.547
Maximum	25.1	Median	1.7
SD	4.235	CV	1.663
k hat (MLE)	0.367	k star (bias corrected MLE)	0.357
Theta hat (MLE)	6.946	Theta star (bias corrected MLE)	7.126
nu hat (MLE)	34.47	nu star (bias corrected)	33.6
MLE Mean (bias corrected)	2.547	MLE Sd (bias corrected)	4.26
95% Percentile of Chisquare (2kstar)	3.087	90% Percentile	7.331
95% Percentile	11	99% Percentile	20.33

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	14.3	17.87	95% Approx. Gamma UPL	10.26	11.95
95% Gamma USL	27.14	39.3			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.891	SD (KM)	4.005
Variance (KM)	16.04	SE of Mean (KM)	0.594
k hat (KM)	0.521	k star (KM)	0.502
nu hat (KM)	48.96	nu star (KM)	47.17
theta hat (KM)	5.549	theta star (KM)	5.76
80% gamma percentile (KM)	4.748	90% gamma percentile (KM)	7.815
95% gamma percentile (KM)	11.09	99% gamma percentile (KM)	19.14

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	9.133	9.017	95% Approx. Gamma UPL	7.374	7.191
95% KM Gamma Percentile	7.153	6.965	95% Gamma USL	14.13	14.45

Lognormal GOF Test on Detected Observations Only

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Shapiro Wilk Test Statistic	0.861	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.145	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.143	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	2.761	Mean in Log Scale	0.506
SD in Original Scale	4.115	SD in Log Scale	0.954
95% UTL95% Coverage	11.98	95% BCA UTL95% Coverage	20.12
95% Bootstrap (%) UTL95% Coverage	22.01	95% UPL (t)	8.361
90% Percentile (z)	5.629	95% Percentile (z)	7.96
99% Percentile (z)	15.25	95% USL	27.18

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.688	95% KM UTL (Lognormal)95% Coverage	8.99
KM SD of Logged Data	0.727	95% KM UPL (Lognormal)	6.832
95% KM Percentile Lognormal (z)	6.581	95% KM USL (Lognormal)	16.79

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	2.762	Mean in Log Scale	0.522
SD in Original Scale	4.113	SD in Log Scale	0.917
95% UTL95% Coverage	11.27	95% UPL (t)	7.977
90% Percentile (z)	5.454	95% Percentile (z)	7.608
99% Percentile (z)	14.21	95% USL	24.77

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	25.1
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	12.28
95% USL	25.1	95% KM Chebyshev UPL	20.53

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (cobalt [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	14	Number of Non-Detects	33
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	4.1	Maximum Non-Detect	2
Variance Detected	0.929	Percent Non-Detects	70.21%
Mean Detected	1.964	SD Detected	0.964

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Mean of Detected Logged Data	0.573	SD of Detected Logged Data	0.459

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.825	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.251	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.263	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	1.292	KM SD	0.672
95% UTL95% Coverage	2.685	95% KM UPL (t)	2.431
90% KM Percentile (z)	2.153	95% KM Percentile (z)	2.397
99% KM Percentile (z)	2.854	95% KM USL	3.262

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.968	SD	0.841
95% UTL95% Coverage	2.712	95% UPL (t)	2.395
90% Percentile (z)	2.046	95% Percentile (z)	2.352
99% Percentile (z)	2.925	95% USL	3.435

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.658	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.215	**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)	5.065	k star (bias corrected MLE)	4.028
Theta hat (MLE)	0.388	Theta star (bias corrected MLE)	0.488
nu hat (MLE)	141.8	nu star (bias corrected)	112.8
MLE Mean (bias corrected)	1.964		
MLE Sd (bias corrected)	0.979	95% Percentile of Chisquare (2kstar)	15.59

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	0.67
Maximum	4.1	Median	0.0108
SD	1.01	CV	1.507
k hat (MLE)	0.341	k star (bias corrected MLE)	0.333
Theta hat (MLE)	1.966	Theta star (bias corrected MLE)	2.011
nu hat (MLE)	32.05	nu star (bias corrected)	31.34
MLE Mean (bias corrected)	0.67	MLE Sd (bias corrected)	1.161
95% Percentile of Chisquare (2kstar)	2.947	90% Percentile	1.95

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% Percentile	2.962	99% Percentile	5.561

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	3.867	4.504	95% Approx. Gamma UPL	2.717	2.956
95% Gamma USL	7.596	10.22			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.292	SD (KM)	0.672
Variance (KM)	0.451	SE of Mean (KM)	0.102
k hat (KM)	3.702	k star (KM)	3.48
nu hat (KM)	348	nu star (KM)	327.1
theta hat (KM)	0.349	theta star (KM)	0.371
80% gamma percentile (KM)	1.811	90% gamma percentile (KM)	2.221
95% gamma percentile (KM)	2.601	99% gamma percentile (KM)	3.418

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2.555	2.54	95% Approx. Gamma UPL	2.262	2.241
95% KM Gamma Percentile	2.224	2.203	95% Gamma USL	3.314	3.329

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.895	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.197	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.208	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.909	Mean in Log Scale	-0.483
SD in Original Scale	0.886	SD in Log Scale	0.893
95% UTL95% Coverage	3.937	95% BCA UTL95% Coverage	3.8
95% Bootstrap (%) UTL95% Coverage	3.8	95% UPL (t)	2.81
90% Percentile (z)	1.94	95% Percentile (z)	2.683
99% Percentile (z)	4.933	95% USL	8.48

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.175	95% KM UTL (Lognormal)95% Coverage	2.495
KM SD of Logged Data	0.357	95% KM UPL (Lognormal)	2.181
95% KM Percentile Lognormal (z)	2.141	95% KM USL (Lognormal)	3.389

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.968	Mean in Log Scale	-0.272
SD in Original Scale	0.841	SD in Log Scale	0.63
95% UTL95% Coverage	2.817	95% UPL (t)	2.221
90% Percentile (z)	1.71	95% Percentile (z)	2.15
99% Percentile (z)	3.303	95% USL	4.841

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	4.1
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	3.1
95% USL	4.1	95% KM Chebyshev UPL	4.25

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (dissolved solids, total [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	45	Number of Distinct Observations	40
Minimum	278	First Quartile	354
Second Largest	514	Median	380
Maximum	528	Third Quartile	430
Mean	394	SD	57.9
Coefficient of Variation	0.147	Skewness	0.345
Mean of logged Data	5.966	SD of logged Data	0.147

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.085	d2max (for USL)	2.915

Normal GOF Test

Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.926	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.111	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.153	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	514.7	90% Percentile (z)	468.2
	95% UPL (t)	492.4	95% Percentile (z)	489.2
	95% USL	562.8	99% Percentile (z)	528.7

Gamma GOF Test

A-D Test Statistic	0.239	**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	0.0927	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.131	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	47.82	k star (bias corrected MLE)	44.65
Theta hat (MLE)	8.24	Theta star (bias corrected MLE)	8.825
nu hat (MLE)	4304	nu star (bias corrected)	4018
MLE Mean (bias corrected)	394	MLE Sd (bias corrected)	58.97

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	497	90% Percentile	471.2

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% Hawkins Wixley (HW) Approx. Gamma UPL	497.7	95% Percentile	495.8
95% WH Approx. Gamma UTL with 95% Coverage	523.5	99% Percentile	544
95% HW Approx. Gamma UTL with 95% Coverage	524.8		
95% WH USL	583.4	95% HW USL	586.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.985	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.953	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.0829	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.12	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	529.2	90% Percentile (z)	470.4
95% UPL (t)	500.1	95% Percentile (z)	496.2
95% USL	597.7	99% Percentile (z)	548.3

Nonparametric Distribution Free Background Statistics
Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	45	95% UTL with 95% Coverage	528
Approx, f used to compute achieved CC	2.368	Approximate Actual Confidence Coefficient achieved by UTL	0.901
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	525.2	95% BCA Bootstrap UTL with 95% Coverage	520.8
95% UPL	507.4	90% Percentile	474.4
90% Chebyshev UPL	569.6	95% Percentile	490.4
95% Chebyshev UPL	649.2	99% Percentile	521.8
95% USL	528		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (fluoride [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	28
Minimum	120	First Quartile	160.6
Second Largest	220	Median	171.2
Maximum	230	Third Quartile	197.4
Mean	176.9	SD	23.75
Coefficient of Variation	0.134	Skewness	0.0922
Mean of logged Data	5.166	SD of logged Data	0.136

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.928	Data appear Normal at 1% Significance Level	

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.15	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	226.1	90% Percentile (z)		207.3
	95% UPL (t)	217.1	95% Percentile (z)		215.9
	95% USL	246.5	99% Percentile (z)		232.1

Gamma GOF Test

A-D Test Statistic	0.386	**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	0.108	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.129	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	55.95	k star (bias corrected MLE)	52.39
Theta hat (MLE)	3.161	Theta star (bias corrected MLE)	3.376
nu hat (MLE)	5259	nu star (bias corrected)	4925
MLE Mean (bias corrected)	176.9	MLE Sd (bias corrected)	24.43

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		219.4	90% Percentile		208.8
95% Hawkins Wixley (HW) Approx. Gamma UPL		219.7	95% Percentile		218.9
95% WH Approx. Gamma UTL with	95% Coverage	229.9	99% Percentile		238.6
95% HW Approx. Gamma UTL with	95% Coverage	230.5			
	95% WH USL	255.3	95% HW USL		256.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.954	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.098	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.118	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	232.5	90% Percentile (z)		208.7
	95% UPL (t)	220.8	95% Percentile (z)		219.3
	95% USL	261.3	99% Percentile (z)		240.6

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order		47	95% UTL with	95% Coverage	230
Approx, f used to compute achieved CC		2.474	Approximate Actual Confidence Coefficient achieved by UTL		0.91
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	227	95% BCA Bootstrap UTL with	95% Coverage	220
	95% UPL	220		90% Percentile	204
	90% Chebyshev UPL	248.8		95% Percentile	217
	95% Chebyshev UPL	281.5		99% Percentile	225.4
	95% USL	230			

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (iron [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Minimum	0.179	First Quartile	0.428
Second Largest	0.709	Median	0.53
Maximum	1.42	Third Quartile	0.673
Mean	0.629	SD	0.426
Coefficient of Variation	0.677	Skewness	1.52
Mean of logged Data	-0.649	SD of logged Data	0.68

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach, refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.713	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.259	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.373	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	2.208	90% Percentile (z)	1.174
95% UPL (t)	1.556	95% Percentile (z)	1.329
95% USL	1.405	99% Percentile (z)	1.619

Gamma GOF Test

A-D Test Statistic	0.248	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.702	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.176	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	2.863	k star (bias corrected MLE)	1.543
Theta hat (MLE)	0.22	Theta star (bias corrected MLE)	0.408
nu hat (MLE)	34.35	nu star (bias corrected)	18.51
MLE Mean (bias corrected)	0.629	MLE Sd (bias corrected)	0.506

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.837	90% Percentile	1.301

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% Hawkins Wixley (HW) Approx. Gamma UPL	1.914	95% Percentile	1.622
95% WH Approx. Gamma UTL with 95% Coverage	3.426	99% Percentile	2.347
95% HW Approx. Gamma UTL with 95% Coverage	3.824		
95% WH USL	1.558	95% HW USL	1.601

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.826	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.187	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.298	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	6.51	90% Percentile (z)	1.25
95% UPL (t)	2.297	95% Percentile (z)	1.6
95% USL	1.805	99% Percentile (z)	2.544

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	6	95% UTL with 95% Coverage	1.42
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by UTL	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.42	95% BCA Bootstrap UTL with 95% Coverage	1.42
95% UPL	1.42	90% Percentile	1.065
90% Chebyshev UPL	2.009	95% Percentile	1.242
95% Chebyshev UPL	2.634	99% Percentile	1.384
95% USL	1.42		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (lead [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	8		
Number of Detects	7	Number of Non-Detects	40
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	1.3	Minimum Non-Detect	1
Maximum Detect	6.2	Maximum Non-Detect	2
Variance Detected	3.175	Percent Non-Detects	85.11%
Mean Detected	2.714	SD Detected	1.782
Mean of Detected Logged Data	0.843	SD of Detected Logged Data	0.577

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.82	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.73	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.24	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.35	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	1.257	KM SD	0.882
95% UTL95% Coverage	3.086	95% KM UPL (t)	2.753
90% KM Percentile (z)	2.388	95% KM Percentile (z)	2.708
99% KM Percentile (z)	3.309	95% KM USL	3.844

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.862	SD	1.021
95% UTL95% Coverage	2.98	95% UPL (t)	2.594
90% Percentile (z)	2.17	95% Percentile (z)	2.541
99% Percentile (z)	3.237	95% USL	3.856

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.415	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.711	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.207	**Kolmogorov-Smirnov GOF**
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 on Detected Data Only

k hat (MLE)	3.378	k star (bias corrected MLE)	2.026
Theta hat (MLE)	0.803	Theta star (bias corrected MLE)	1.34
nu hat (MLE)	47.3	nu star (bias corrected)	28.36
MLE Mean (bias corrected)	2.714		
MLE Sd (bias corrected)	1.907	95% Percentile of Chisquare (2kstar)	9.571

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	0.417
Maximum	6.2	Median	0.01
SD	1.166	CV	2.797
k hat (MLE)	0.249	k star (bias corrected MLE)	0.247
Theta hat (MLE)	1.674	Theta star (bias corrected MLE)	1.685
nu hat (MLE)	23.4	nu star (bias corrected)	23.24
MLE Mean (bias corrected)	0.417	MLE Sd (bias corrected)	0.838
95% Percentile of Chisquare (2kstar)	2.401	90% Percentile	1.252
95% Percentile	2.024	99% Percentile	4.082

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2.004	1.884	95% Approx. Gamma UPL	1.34	1.181

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% Gamma USL	4.256	4.612

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.257	SD (KM)	0.882
Variance (KM)	0.778	SE of Mean (KM)	0.139
k hat (KM)	2.033	k star (KM)	1.917
nu hat (KM)	191.1	nu star (KM)	180.2
theta hat (KM)	0.619	theta star (KM)	0.656
80% gamma percentile (KM)	1.892	90% gamma percentile (KM)	2.47
95% gamma percentile (KM)	3.023	99% gamma percentile (KM)	4.252

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2.621	2.568	95% Approx. Gamma UPL	2.297	2.247
95% KM Gamma Percentile	2.254	2.205	95% Gamma USL	3.47	3.428

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.838	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.28	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.62	Mean in Log Scale	-1.485
SD in Original Scale	1.117	SD in Log Scale	1.454
95% UTL95% Coverage	4.622	95% BCA UTL95% Coverage	3.9
95% Bootstrap (%) UTL95% Coverage	5.51	95% UPL (t)	2.67
90% Percentile (z)	1.46	95% Percentile (z)	2.477
99% Percentile (z)	6.673	95% USL	16.11

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.127	95% KM UTL (Lognormal)95% Coverage	2.419
KM SD of Logged Data	0.365	95% KM UPL (Lognormal)	2.108
95% KM Percentile Lognormal (z)	2.069	95% KM USL (Lognormal)	3.308

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.862	Mean in Log Scale	-0.42
SD in Original Scale	1.021	SD in Log Scale	0.598
95% UTL95% Coverage	2.272	95% UPL (t)	1.813
90% Percentile (z)	1.414	95% Percentile (z)	1.757
99% Percentile (z)	2.642	95% USL	3.797

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	6.2
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	3.38
95% USL	6.2	95% KM Chebyshev UPL	5.142

Background Statistics for Data Sets with Non-Detects

User Selected Options

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From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (lithium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	47
Minimum	12.65	First Quartile	14.75
Second Largest	31.34	Median	16.31
Maximum	33.16	Third Quartile	29
Mean	20.31	SD	7.193
Coefficient of Variation	0.354	Skewness	0.593
Mean of logged Data	2.953	SD of logged Data	0.337

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test

Shapiro Wilk Test Statistic	0.762	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.928	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.304	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.15	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	35.23	90% Percentile (z)	29.53
95% UPL (t)	32.51	95% Percentile (z)	32.14
95% USL	41.4	99% Percentile (z)	37.04

Gamma GOF Test

A-D Test Statistic	4.496	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.75	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.283	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.129	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	8.817	k star (bias corrected MLE)	8.268
Theta hat (MLE)	2.304	Theta star (bias corrected MLE)	2.457
nu hat (MLE)	828.8	nu star (bias corrected)	777.2
MLE Mean (bias corrected)	20.31	MLE Sd (bias corrected)	7.064

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	33.36	90% Percentile	29.73
95% Hawkins Wixley (HW) Approx. Gamma UPL	33.5	95% Percentile	33.15
95% WH Approx. Gamma UTL with 95% Coverage	37.14	99% Percentile	40.23
95% HW Approx. Gamma UTL with 95% Coverage	37.46		
95% WH USL	46.76	95% HW USL	47.76

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.79	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.954	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.118	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	38.6	90% Percentile (z)	29.54
	95% UPL (t)	33.98	95% Percentile (z)	33.4
	95% USL	51.57	99% Percentile (z)	42.03

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order		47	95% UTL with 95% Coverage	33.16
Approx, f used to compute achieved CC		2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	32.61	95% BCA Bootstrap UTL with 95% Coverage	32.61
	95% UPL	31.17	90% Percentile	30.35
	90% Chebyshev UPL	42.12	95% Percentile	30.84
	95% Chebyshev UPL	51.99	99% Percentile	32.32
	95% USL	33.16		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (manganese [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Minimum	0.0791	First Quartile	0.128
Second Largest	0.21	Median	0.166
Maximum	0.599	Third Quartile	0.206
Mean	0.224	SD	0.19
Coefficient of Variation	0.848	Skewness	2.112
Mean of logged Data	-1.72	SD of logged Data	0.686

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach, refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.713	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.362	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.373	Data appear Normal at 1% Significance Level

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.928	90% Percentile (z)	0.467
	95% UPL (t)	0.637	95% Percentile (z)	0.536
	95% USL	0.57	99% Percentile (z)	0.665

Gamma GOF Test

A-D Test Statistic	0.483	**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	0.285	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	2.391	k star (bias corrected MLE)	1.307
Theta hat (MLE)	0.0936	Theta star (bias corrected MLE)	0.171
nu hat (MLE)	28.7	nu star (bias corrected)	15.68
MLE Mean (bias corrected)	0.224	MLE Sd (bias corrected)	0.196

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.701	90% Percentile	0.482
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.718	95% Percentile	0.611
95% WH Approx. Gamma UTL with 95% Coverage	1.359	99% Percentile	0.904
95% HW Approx. Gamma UTL with 95% Coverage	1.489		
95% WH USL	0.588	95% HW USL	0.594

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.826	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.241	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.298	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.281	90% Percentile (z)	0.431
	95% UPL (t)	0.797	95% Percentile (z)	0.554
	95% USL	0.625	99% Percentile (z)	0.884

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order		6	95% UTL with 95% Coverage	0.599
Approx, f used to compute achieved CC		0.316	Approximate Actual Confidence Coefficient achieved by UTL	0.265
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	0.599	95% BCA Bootstrap UTL with 95% Coverage	0.599
	95% UPL	0.599	90% Percentile	0.405
	90% Chebyshev UPL	0.839	95% Percentile	0.502
	95% Chebyshev UPL	1.117	99% Percentile	0.58

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% USL 0.599

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (mercury [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	1		
Number of Detects	0	Number of Non-Detects	47
Number of Distinct Detects	0	Number of Distinct Non-Detects	1
Minimum Detect	N/A	Minimum Non-Detect	0.2
Maximum Detect	N/A	Maximum Non-Detect	0.2
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

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 x_ols (mercury [ug/l]_interwell_pooled-upgradient) was not processed!

x_ols (molybdenum [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	34		
Number of Detects	31	Number of Non-Detects	16
Number of Distinct Detects	31	Number of Distinct Non-Detects	3
Minimum Detect	13.74	Minimum Non-Detect	1
Maximum Detect	69.2	Maximum Non-Detect	5
Variance Detected	179.6	Percent Non-Detects	34.04%
Mean Detected	29.14	SD Detected	13.4
Mean of Detected Logged Data	3.276	SD of Detected Logged Data	0.443

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.902	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.17	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.182	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	19.56	KM SD	17.1

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% UTL95% Coverage	55.02	95% KM UPL (t)	48.57
90% KM Percentile (z)	41.47	95% KM Percentile (z)	47.68
99% KM Percentile (z)	59.34	95% KM USL	69.71

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	19.47	SD	17.39
95% UTL95% Coverage	55.52	95% UPL (t)	48.96
90% Percentile (z)	41.75	95% Percentile (z)	48.07
99% Percentile (z)	59.91	95% USL	70.45

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.934	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.178	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.158	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.348	k star (bias corrected MLE)	4.852
Theta hat (MLE)	5.448	Theta star (bias corrected MLE)	6.005
nu hat (MLE)	331.6	nu star (bias corrected)	300.8
MLE Mean (bias corrected)	29.14		
MLE Sd (bias corrected)	13.23	95% Percentile of Chisquare (2kstar)	17.9

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	0.01	Mean	20.74
Maximum	69.2	Median	17.76
SD	16.16	CV	0.779
k hat (MLE)	0.712	k star (bias corrected MLE)	0.681
Theta hat (MLE)	29.11	Theta star (bias corrected MLE)	30.45
nu hat (MLE)	66.95	nu star (bias corrected)	64.01
MLE Mean (bias corrected)	20.74	MLE Sd (bias corrected)	25.13
95% Percentile of Chisquare (2kstar)	4.682	90% Percentile	52.39
95% Percentile	71.29	99% Percentile	116.5

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	88.47	110.8	95% Approx. Gamma UPL	68.48	81.38
95% Gamma USL	147.6	207			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	19.56	SD (KM)	17.1
Variance (KM)	292.4	SE of Mean (KM)	2.535
k hat (KM)	1.308	k star (KM)	1.239
nu hat (KM)	123	nu star (KM)	116.5
theta hat (KM)	14.95	theta star (KM)	15.79
80% gamma percentile (KM)	30.87	90% gamma percentile (KM)	42.71

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% gamma percentile (KM)	54.37	99% gamma percentile (KM)	81.02

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	87.56	101.5	95% Approx. Gamma UPL	66.72	73.92
95% KM Gamma Percentile	64.16	70.65	95% Gamma USL	150.2	192.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.143	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	22.42	Mean in Log Scale	2.912
SD in Original Scale	14.43	SD in Log Scale	0.642
95% UTL95% Coverage	69.74	95% BCA UTL95% Coverage	62.13
95% Bootstrap (%) UTL95% Coverage	63.55	95% UPL (t)	54.72
90% Percentile (z)	41.92	95% Percentile (z)	52.94
99% Percentile (z)	82.02	95% USL	121.1

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.161	95% KM UTL (Lognormal)95% Coverage	235.6
KM SD of Logged Data	1.592	95% KM UPL (Lognormal)	129.2
95% KM Percentile Lognormal (z)	119	95% KM USL (Lognormal)	924.4

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	19.47	Mean in Log Scale	2.019
SD in Original Scale	17.39	SD in Log Scale	1.819
95% UTL95% Coverage	327.3	95% UPL (t)	164.7
90% Percentile (z)	77.47	95% Percentile (z)	150
99% Percentile (z)	518	95% USL	1560

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	69.2
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	48.48
95% USL	69.2	95% KM Chebyshev UPL	94.88

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (nickel [ug/l]_interwell_pooled-upgradient)

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

General Statistics

Total Number of Observations	29	Number of Missing Observations	0
Number of Distinct Observations	23		
Number of Detects	26	Number of Non-Detects	3
Number of Distinct Detects	23	Number of Distinct Non-Detects	1
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	12	Maximum Non-Detect	1
Variance Detected	7.667	Percent Non-Detects	10.34%
Mean Detected	4.562	SD Detected	2.769
Mean of Detected Logged Data	1.352	SD of Detected Logged Data	0.602

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.232	d2max (for USL)	2.73

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.891	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.154	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.199	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	4.193	KM SD	2.79
95% UTL95% Coverage	10.42	95% KM UPL (t)	9.021
90% KM Percentile (z)	7.769	95% KM Percentile (z)	8.783
99% KM Percentile (z)	10.68	95% KM USL	11.81

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	4.141	SD	2.904
95% UTL95% Coverage	10.62	95% UPL (t)	9.165
90% Percentile (z)	7.862	95% Percentile (z)	8.917
99% Percentile (z)	10.9	95% USL	12.07

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.299	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.75	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.083	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.172	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)	3.17	k star (bias corrected MLE)	2.83
Theta hat (MLE)	1.439	Theta star (bias corrected MLE)	1.612
nu hat (MLE)	164.8	nu star (bias corrected)	147.1
MLE Mean (bias corrected)	4.562		
MLE Sd (bias corrected)	2.712	95% Percentile of Chisquare (2kstar)	12.08

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.

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.112
Maximum	12	Median	3.9
SD	2.943	CV	0.716
k hat (MLE)	1.257	k star (bias corrected MLE)	1.15
Theta hat (MLE)	3.27	Theta star (bias corrected MLE)	3.575
nu hat (MLE)	72.93	nu star (bias corrected)	66.72
MLE Mean (bias corrected)	4.112	MLE Sd (bias corrected)	3.834
95% Percentile of Chisquare (2kstar)	6.562	90% Percentile	9.147
95% Percentile	11.73	99% Percentile	17.66

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	15.7	18.34	95% Approx. Gamma UPL	11.78	13.13
95% Gamma USL	20.37	24.91			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.193	SD (KM)	2.79
Variance (KM)	7.786	SE of Mean (KM)	0.528
k hat (KM)	2.258	k star (KM)	2.048
nu hat (KM)	131	nu star (KM)	118.8
theta hat (KM)	1.857	theta star (KM)	2.048
80% gamma percentile (KM)	6.26	90% gamma percentile (KM)	8.11
95% gamma percentile (KM)	9.872	99% gamma percentile (KM)	13.78

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	12.3	12.87	95% Approx. Gamma UPL	9.734	9.975
95% KM Gamma Percentile	9.336	9.536	95% Gamma USL	15.26	16.33

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.971	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.933	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.104	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.156	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	4.191	Mean in Log Scale	1.209
SD in Original Scale	2.842	SD in Log Scale	0.713
95% UTL95% Coverage	16.47	95% BCA UTL95% Coverage	12
95% Bootstrap (%) UTL95% Coverage	12	95% UPL (t)	11.51
90% Percentile (z)	8.358	95% Percentile (z)	10.83
99% Percentile (z)	17.61	95% USL	23.49

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	1.212	95% KM UTL (Lognormal)95% Coverage	15.81
KM SD of Logged Data	0.694	95% KM UPL (Lognormal)	11.16
95% KM Percentile Lognormal (z)	10.52	95% KM USL (Lognormal)	22.34

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	4.141	Mean in Log Scale	1.14

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

SD in Original Scale	2.904	SD in Log Scale	0.851
95% UTL95% Coverage	20.91	95% UPL (t)	13.64
90% Percentile (z)	9.311	95% Percentile (z)	12.69
99% Percentile (z)	22.66	95% USL	31.96

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	29	95% UTL with95% Coverage	12
Approx, f used to compute achieved CC	1.526	Approximate Actual Confidence Coefficient achieved by UTL	0.774
Approximate Sample Size needed to achieve specified CC	59	95% UPL	12
95% USL	12	95% KM Chebyshev UPL	16.56

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (ph, lab [su]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	44
Minimum	6.43	First Quartile	6.97
Second Largest	8.03	Median	7.33
Maximum	8.17	Third Quartile	7.532
Mean	7.243	SD	0.42
Coefficient of Variation	0.058	Skewness	-0.326
Mean of logged Data	1.978	SD of logged Data	0.0587

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.928	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.159	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.15	Data Not Normal at 1% Significance Level	

Data appear Approximate Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	8.113	90% Percentile (z)	7.781
95% UPL (t)	7.955	95% Percentile (z)	7.933
95% USL	8.474	99% Percentile (z)	8.219

Gamma GOF Test

A-D Test Statistic	1.267	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.167	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.129	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Gamma Statistics

k hat (MLE)	299.5	k star (bias corrected MLE)	280.4
Theta hat (MLE)	0.0242	Theta star (bias corrected MLE)	0.0258
nu hat (MLE)	28157	nu star (bias corrected)	26361
MLE Mean (bias corrected)	7.243	MLE Sd (bias corrected)	0.433

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	7.976	90% Percentile	7.802
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.979	95% Percentile	7.969
95% WH Approx. Gamma UTL with 95% Coverage	8.147	99% Percentile	8.287
95% HW Approx. Gamma UTL with 95% Coverage	8.152		
95% WH USL	8.547	95% HW USL	8.557

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.954	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.169	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.118	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	8.166	90% Percentile (z)	7.796
95% UPL (t)	7.988	95% Percentile (z)	7.963
95% USL	8.588	99% Percentile (z)	8.288

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	47	95% UTL with 95% Coverage	8.17
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	8.128	95% BCA Bootstrap UTL with 95% Coverage	8.043
95% UPL	7.917	90% Percentile	7.658
90% Chebyshev UPL	8.516	95% Percentile	7.748
95% Chebyshev UPL	9.092	99% Percentile	8.106
95% USL	8.17		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (radium-226/228 [pci/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	14
Minimum	0.497	First Quartile	2
Second Largest	2.54	Median	2
Maximum	2.65	Third Quartile	2
Mean	1.792	SD	0.51

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Coefficient of Variation	0.284	Skewness	-1.521
Mean of logged Data	0.518	SD of logged Data	0.418

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test

Shapiro Wilk Test Statistic	0.671	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.928	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.424	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.15	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	2.849	90% Percentile (z)	2.445
	95% UPL (t)	2.657	95% Percentile (z)	2.63
	95% USL	3.287	99% Percentile (z)	2.978

Gamma GOF Test

A-D Test Statistic	8.73	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.433	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.129	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.801	k star (bias corrected MLE)	7.317
Theta hat (MLE)	0.23	Theta star (bias corrected MLE)	0.245
nu hat (MLE)	733.3	nu star (bias corrected)	687.8
MLE Mean (bias corrected)	1.792	MLE Sd (bias corrected)	0.663

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		3.024	90% Percentile	2.676
95% Hawkins Wixley (HW) Approx. Gamma UPL		3.101	95% Percentile	3.002
95% WH Approx. Gamma UTL with	95% Coverage	3.383	99% Percentile	3.68
95% HW Approx. Gamma UTL with	95% Coverage	3.499		
	95% WH USL	4.302	95% HW USL	4.548

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.596	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.954	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.428	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.118	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	3.993	90% Percentile (z)	2.868
	95% UPL (t)	3.41	95% Percentile (z)	3.338
	95% USL	5.717	99% Percentile (z)	4.437

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	47	95% UTL with 95% Coverage	2.65
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	2.617	95% BCA Bootstrap UTL with 95% Coverage	2.54
95% UPL	2.396	90% Percentile	2
90% Chebyshev UPL	3.337	95% Percentile	2.126
95% Chebyshev UPL	4.037	99% Percentile	2.599
95% USL	2.65		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (selenium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	41
Minimum	2.8	First Quartile	4.05
Second Largest	22.95	Median	13
Maximum	23.01	Third Quartile	16.79
Mean	11.8	SD	6.697
Coefficient of Variation	0.568	Skewness	0.0621
Mean of logged Data	2.259	SD of logged Data	0.703

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.928	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.171	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.15	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	25.69	90% Percentile (z)	20.38
95% UPL (t)	23.16	95% Percentile (z)	22.82
95% USL	31.44	99% Percentile (z)	27.38

Gamma GOF Test

A-D Test Statistic	2.174	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.759	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.168	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.13	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.546	k star (bias corrected MLE)	2.398
Theta hat (MLE)	4.634	Theta star (bias corrected MLE)	4.921
nu hat (MLE)	239.3	nu star (bias corrected)	225.4

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

MLE Mean (bias corrected)	11.8	MLE Sd (bias corrected)	7.62

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	26.89	90% Percentile	22
95% Hawkins Wixley (HW) Approx. Gamma UPL	27.75	95% Percentile	26.46
95% WH Approx. Gamma UTL with 95% Coverage	32.08	99% Percentile	36.23
95% HW Approx. Gamma UTL with 95% Coverage	33.66		
95% WH USL	46.31	95% HW USL	50.59

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.848	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.954	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.179	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.118	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	41.11	90% Percentile (z)	23.56
95% UPL (t)	31.54	95% Percentile (z)	30.41
95% USL	75.18	99% Percentile (z)	49.1

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	47	95% UTL with 95% Coverage	23.01
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	22.99	95% BCA Bootstrap UTL with 95% Coverage	22.95
95% UPL	22.77	90% Percentile	20.72
90% Chebyshev UPL	32.1	95% Percentile	22.19
95% Chebyshev UPL	41.3	99% Percentile	22.98
95% USL	23.01		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (sulfate [mg/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Distinct Observations	44
Minimum	19.71	First Quartile	41.26
Second Largest	88	Median	56.45
Maximum	101.8	Third Quartile	70.04
Mean	56.56	SD	17.69
Coefficient of Variation	0.313	Skewness	0.176
Mean of logged Data	3.983	SD of logged Data	0.338

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.928	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.0832	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.15	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	93.25	90% Percentile (z)	79.24
	95% UPL (t)	86.58	95% Percentile (z)	85.66
	95% USL	108.4	99% Percentile (z)	97.72

Gamma GOF Test

A-D Test Statistic	0.489	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.749	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0826	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.129	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.694	k star (bias corrected MLE)	9.089
Theta hat (MLE)	5.835	Theta star (bias corrected MLE)	6.223
nu hat (MLE)	911.2	nu star (bias corrected)	854.4
MLE Mean (bias corrected)	56.56	MLE Sd (bias corrected)	18.76

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		91.11	90% Percentile	81.54
95% Hawkins Wixley (HW) Approx. Gamma UPL		91.99	95% Percentile	90.54
95% WH Approx. Gamma UTL with	95% Coverage	101	99% Percentile	109.1
95% HW Approx. Gamma UTL with	95% Coverage	102.5		
	95% WH USL	126	95% HW USL	129.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.954	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0973	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.118	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	108.2	90% Percentile (z)	82.8
	95% UPL (t)	95.27	95% Percentile (z)	93.62
	95% USL	144.7	99% Percentile (z)	117.9

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order		47	95% UTL with 95% Coverage	101.8
Approx, f used to compute achieved CC		2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	97.67	95% BCA Bootstrap UTL with 95% Coverage	88

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

95% UPL	85.42	90% Percentile	78.4
90% Chebyshev UPL	110.2	95% Percentile	80.78
95% Chebyshev UPL	134.5	99% Percentile	95.46
95% USL	101.8		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (thallium [ug/l]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	47	Number of Missing Observations	0
Number of Distinct Observations	3		
Number of Detects	2	Number of Non-Detects	45
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	1.4	Maximum Non-Detect	2
Variance Detected	0.08	Percent Non-Detects	95.74%
Mean Detected	1.2	SD Detected	0.283
Mean of Detected Logged Data	0.168	SD of Detected Logged Data	0.238

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.074	d2max (for USL)	2.933

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	1.017	KM SD	0.0816
95% UTL95% Coverage	1.187	95% KM UPL (t)	1.156
90% KM Percentile (z)	1.122	95% KM Percentile (z)	1.152
99% KM Percentile (z)	1.207	95% KM USL	1.257

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.785	SD	0.265
95% UTL95% Coverage	1.335	95% UPL (t)	1.235
90% Percentile (z)	1.125	95% Percentile (z)	1.222
99% Percentile (z)	1.402	95% USL	1.563

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	35.66	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0336	Theta star (bias corrected MLE)	N/A

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

nu hat (MLE)	142.7	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2kstar)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.017	SD (KM)	0.0816
Variance (KM)	0.00665	SE of Mean (KM)	0.0241
k hat (KM)	155.6	k star (KM)	145.6
nu hat (KM)	14622	nu star (KM)	13690
theta hat (KM)	0.00654	theta star (KM)	0.00699
80% gamma percentile (KM)	1.088	90% gamma percentile (KM)	1.127
95% gamma percentile (KM)	1.16	99% gamma percentile (KM)	1.224

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.175	1.174	95% Approx. Gamma UPL	1.145	1.144
95% KM Gamma Percentile	1.141	1.14	95% Gamma USL	1.246	1.245

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.3	Mean in Log Scale	-1.628
SD in Original Scale	0.303	SD in Log Scale	0.941
95% UTL95% Coverage	1.381	95% BCA UTL95% Coverage	1.232
95% Bootstrap (%) UTL95% Coverage	1.341	95% UPL (t)	0.968
90% Percentile (z)	0.655	95% Percentile (z)	0.923
99% Percentile (z)	1.752	95% USL	3.098

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.0146	95% KM UTL (Lognormal)95% Coverage	1.17
KM SD of Logged Data	0.0686	95% KM UPL (Lognormal)	1.14
95% KM Percentile Lognormal (z)	1.136	95% KM USL (Lognormal)	1.241

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.785	Mean in Log Scale	-0.303
SD in Original Scale	0.265	SD in Log Scale	0.358
95% UTL95% Coverage	1.553	95% UPL (t)	1.357
90% Percentile (z)	1.169	95% Percentile (z)	1.332
99% Percentile (z)	1.7	95% USL	2.112

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	47	95% UTL with95% Coverage	2
Approx, f used to compute achieved CC	2.474	Approximate Actual Confidence Coefficient achieved by UTL	0.91
Approximate Sample Size needed to achieve specified CC	59	95% UPL	2
95% USL	2	95% KM Chebyshev UPL	1.377

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

x_ols (turbidity, field [ntu]_interwell_pooled-upgradient)

General Statistics

Total Number of Observations	24	Number of Distinct Observations	23
Minimum	3.82	First Quartile	18.9
Second Largest	95.6	Median	26.05
Maximum	133	Third Quartile	34.98
Mean	35.76	SD	32.11
Coefficient of Variation	0.898	Skewness	1.802
Mean of logged Data	3.233	SD of logged Data	0.878

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644

Normal GOF Test

Shapiro Wilk Test Statistic	0.769	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.884	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.297	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.205	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	109.9	90% Percentile (z)	76.91
	95% UPL (t)	91.93	95% Percentile (z)	88.58
	95% USL	120.7	99% Percentile (z)	110.5

Gamma GOF Test

A-D Test Statistic	0.746	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.76	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.191	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.599	k star (bias corrected MLE)	1.427
Theta hat (MLE)	22.36	Theta star (bias corrected MLE)	25.05
nu hat (MLE)	76.77	nu star (bias corrected)	68.51
MLE Mean (bias corrected)	35.76	MLE Sd (bias corrected)	29.93

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		97.22	90% Percentile	75.43
95% Hawkins Wixley (HW) Approx. Gamma UPL		100.1	95% Percentile	94.72
95% WH Approx. Gamma UTL with	95% Coverage	132	99% Percentile	138.4
95% HW Approx. Gamma UTL with	95% Coverage	140.2		
	95% WH USL	156.2	95% HW USL	169.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/29/2024 7:33:36 PM
From File	filea1b841356b96.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

10% Shapiro Wilk Critical Value	0.93	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.162	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	192.4	90% Percentile (z)	78.09
	95% UPL (t)	117.7	95% Percentile (z)	107.4
	95% USL	258.2	99% Percentile (z)	195.4

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order		24	95% UTL with 95% Coverage	133
Approx, f used to compute achieved CC		1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	133	95% BCA Bootstrap UTL with 95% Coverage	127.4
	95% UPL	123.7	90% Percentile	87.61
	90% Chebyshev UPL	134.1	95% Percentile	94.69
	95% Chebyshev UPL	178.6	99% Percentile	124.4
	95% USL	133		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

group	D_x_ols	x_ols
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2.54
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	1.31
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	0.693
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	0.691
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2.18
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	334.667949
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	363.2880116
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	311.8798895
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	349.0072761
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	411.8810007
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	372.444694
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	331.0365719
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	325.8220029
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	406.414992
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	373.5570264
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	374.3608449
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	322.4476212
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	351.8433176
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	298.8162441
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	385
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	1	1.3
Lead [ug/L]_Interwell_POOLED-Upgradient	1	6.2
Lead [ug/L]_Interwell_POOLED-Upgradient	1	1.4
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	1	2.6
Lead [ug/L]_Interwell_POOLED-Upgradient	1	2
Lead [ug/L]_Interwell_POOLED-Upgradient	0	2
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.27138183
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.78304257
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.09417328
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.30530399
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.81537463
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.73180567
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.24240635
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.75353706
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.79576064
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	16.64452375
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.28480631
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.51872847
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.09558336
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.64063622
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	18.87773858
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.3
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1

group	D_x_ols	x_ols
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	1	1.4
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	4
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	0	1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	0	1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.9
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.9
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.3
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.9
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	3.3
Arsenic [ug/L]_Interwell_POOLED-Upgradient	0	2
Barium [ug/L]_Interwell_POOLED-Upgradient	1	168
Barium [ug/L]_Interwell_POOLED-Upgradient	1	193
Barium [ug/L]_Interwell_POOLED-Upgradient	1	171
Barium [ug/L]_Interwell_POOLED-Upgradient	1	176
Barium [ug/L]_Interwell_POOLED-Upgradient	1	165
Barium [ug/L]_Interwell_POOLED-Upgradient	1	178
Barium [ug/L]_Interwell_POOLED-Upgradient	1	182
Barium [ug/L]_Interwell_POOLED-Upgradient	1	180
Barium [ug/L]_Interwell_POOLED-Upgradient	1	197
Barium [ug/L]_Interwell_POOLED-Upgradient	1	185
Barium [ug/L]_Interwell_POOLED-Upgradient	1	199
Barium [ug/L]_Interwell_POOLED-Upgradient	1	178
Barium [ug/L]_Interwell_POOLED-Upgradient	1	168
Barium [ug/L]_Interwell_POOLED-Upgradient	1	202
Barium [ug/L]_Interwell_POOLED-Upgradient	1	259
Barium [ug/L]_Interwell_POOLED-Upgradient	1	169
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1

group	D_x_ols	x_ols
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	2
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.218
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.251
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.238
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.211
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.225
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.329
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.357
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.311
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.228
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.242
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.222
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.221
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.176
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.18
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.263
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.3
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	3.3
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.8
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	3.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	3.4
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	4.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.2
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	8.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	4.9
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.48
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1

group	D_x_ols	x_ols
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.7
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.7
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	3.1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.3
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.4
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	4.1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	2.7
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	2
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.8
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	4
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.4
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	4.4
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	4.1
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	4
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	4
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.7
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	2.8
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.8
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.5
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.7
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.3
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	3.7
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	5.4
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	5.14
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	0	5
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	4.4
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	6.2
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	5.4
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	4
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	3.8
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	4.6
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	5
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	5.7
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	8.3
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	12
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	84.3
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	93
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	86.2
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	88.2
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	91.2
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	91
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	97.1
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	85.8
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	90.3
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	91.4
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	79.7
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	75.5

group	D_x_ols	x_ols
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	66.8
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	59.2
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	94.3
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	41
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	65
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	65
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	54
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	58
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	88
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	78
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	79
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	33
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	73
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	69
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	74
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	37
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	79
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	73
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	68.9
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.64
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.54
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.6
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.8
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.11
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.96
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.09
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.52
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.98
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.91
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.43
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.57
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.53
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.66
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	6.59
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.19
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	150
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	170
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	160
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	120
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	140
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	150
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	180
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	160
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	210
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	150
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	180
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	170
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	140
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	170

group	D_x_ols	x_ols
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	170
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	183
Chloride [mg/L]_Interwell_POOLED-Upgradient	0	5
Chloride [mg/L]_Interwell_POOLED-Upgradient	0	5
Chloride [mg/L]_Interwell_POOLED-Upgradient	0	5
Chloride [mg/L]_Interwell_POOLED-Upgradient	0	5
Chloride [mg/L]_Interwell_POOLED-Upgradient	0	5
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	9
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	10
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	2
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	7
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	7
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	7
Chloride [mg/L]_Interwell_POOLED-Upgradient	0	4
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	5
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	7
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	9.07
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	1.57
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	0.503
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	0.512
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	1.29
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.93494218
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.94504622
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.95469099
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.96433575
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.97306197
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.98729948
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.99648498
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	12.7359171
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.77725181
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.81307523
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	12.84200953
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.90906363
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	10.94810197
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11.98025119
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	12.1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	1	3.9
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	2
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.02209572
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.7465519

group	D_x_ols	x_ols
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.86989644
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.49324098
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.21436224
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	14.84882322
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	13.07105612
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	23.96080424
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	13.76085227
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	12.64756057
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	13.31759419
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	15.47989433
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	13.27438414
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	13.75219927
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	13.9
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	1	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	1	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	4
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	3.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.4
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.8
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.5
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.4
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.1
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.35
Barium [ug/L]_Interwell_POOLED-Upgradient	1	227
Barium [ug/L]_Interwell_POOLED-Upgradient	1	171
Barium [ug/L]_Interwell_POOLED-Upgradient	1	118
Barium [ug/L]_Interwell_POOLED-Upgradient	1	133
Barium [ug/L]_Interwell_POOLED-Upgradient	1	121
Barium [ug/L]_Interwell_POOLED-Upgradient	1	129
Barium [ug/L]_Interwell_POOLED-Upgradient	1	133

group	D_x_ols	x_ols
Barium [ug/L]_Interwell_POOLED-Upgradient	1	186
Barium [ug/L]_Interwell_POOLED-Upgradient	1	134
Barium [ug/L]_Interwell_POOLED-Upgradient	1	124
Barium [ug/L]_Interwell_POOLED-Upgradient	1	122
Barium [ug/L]_Interwell_POOLED-Upgradient	1	123
Barium [ug/L]_Interwell_POOLED-Upgradient	1	120
Barium [ug/L]_Interwell_POOLED-Upgradient	1	131
Barium [ug/L]_Interwell_POOLED-Upgradient	1	138
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	2
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.671179066
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.365168548
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.466067599
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.59196665
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.307684839
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.173488199
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.123296819
Boron [mg/L]_Interwell_POOLED-Upgradient	1	1.561890713
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.289029502
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.21008312
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.197780272
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.458983197
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.202669831
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.191
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	14.8
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.8

group	D_x_ols	x_ols
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	2
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	3.1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.4
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	2
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	85.9
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	85.3
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	76.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	81.9
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	85.6
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	81.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	80.3
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	110
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	89.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	80.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	80.3
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	86.9
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	69.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	80.9
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	17.07717972
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	18.3347054
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	21.39416173
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	22.95361806
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	18.11693569
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	18.55708551
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	18.91847249
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	23.01012434
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	16.03636575
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	14.58577497
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	20.26414395
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	20.1822689
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	15.51816357
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	21.48301799
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	22.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	15.0989984
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	18.06731321
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	25.63252279
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	23.29773238
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	17.75673153
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	17.7529933
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	15.51509767
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	43.71449939
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	17.89396905
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	13.73617609
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	16.23180485
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	18.28516675
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	15.84911031
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	18.66647561
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	16.3
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	12
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	3.2
Nickel [ug/L]_Interwell_POOLED-Upgradient	0	1
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	1

group	D_x_ols	x_ols
Nickel [ug/L]_Interwell_POOLED-Upgradient	0	1
Nickel [ug/L]_Interwell_POOLED-Upgradient	0	1
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	1.2
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	4
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	1.9
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	56.20653365
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	38.28995592
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	44.36958628
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	56.44921663
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	41.52126314
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	33.63881272
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	19.71465115
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	101.819645
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	37.16091799
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	34.45668788
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	36.69557895
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	46.24919951
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	31.57151285
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	33.83694737
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	35.3
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.498630361
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.536840854
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.575132687
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.573424521
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.701879037
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.599357459
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.747730634
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.526771219
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.629450507
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.353105889
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.74798139
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.336105568
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.569191561
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.503497674
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	8.03
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	190
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	220
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	210
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	200
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	200
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	200
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	220
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	230
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	190
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	200
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	190
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	190
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	200
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	200
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	197

group	D_x_ols	x_ols
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	1.63
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	0.497
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2.65
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	1.31
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	2
Radium-226/228 [pCi/L]_Interwell_POOLED-Upgradient	1	0.852
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	460
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	484
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	452
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	472
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	492
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	514
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	424
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	528
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	430
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	436
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	446
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	416
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	432
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	476
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	430
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	418
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	1
Lead [ug/L]_Interwell_POOLED-Upgradient	0	2
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	28.93874805
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	28.94271621
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	29.9417335
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	29.4407508
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	31.33976809
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	30.68829404
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	30.29721306
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	28.99623036
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	33.15820362
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	29.81368318
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	27.28004717
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	30.90680425
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	30.42467964
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	29.34550315
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	29.59701454
Lithium [ug/L]_Interwell_POOLED-Upgradient	1	29
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1

group	D_x_ols	x_ols
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	1
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Thallium [ug/L]_Interwell_POOLED-Upgradient	0	2
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	1
Antimony [ug/L]_Interwell_POOLED-Upgradient	0	4
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.5
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.8
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.8
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.4
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.5
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.5
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.9
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.7
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	1.9
Arsenic [ug/L]_Interwell_POOLED-Upgradient	1	2.8
Arsenic [ug/L]_Interwell_POOLED-Upgradient	0	2
Barium [ug/L]_Interwell_POOLED-Upgradient	1	145
Barium [ug/L]_Interwell_POOLED-Upgradient	1	139
Barium [ug/L]_Interwell_POOLED-Upgradient	1	123
Barium [ug/L]_Interwell_POOLED-Upgradient	1	130
Barium [ug/L]_Interwell_POOLED-Upgradient	1	128
Barium [ug/L]_Interwell_POOLED-Upgradient	1	141
Barium [ug/L]_Interwell_POOLED-Upgradient	1	155
Barium [ug/L]_Interwell_POOLED-Upgradient	1	144
Barium [ug/L]_Interwell_POOLED-Upgradient	1	143
Barium [ug/L]_Interwell_POOLED-Upgradient	1	165
Barium [ug/L]_Interwell_POOLED-Upgradient	1	133
Barium [ug/L]_Interwell_POOLED-Upgradient	1	134
Barium [ug/L]_Interwell_POOLED-Upgradient	1	138
Barium [ug/L]_Interwell_POOLED-Upgradient	1	131
Barium [ug/L]_Interwell_POOLED-Upgradient	1	153
Barium [ug/L]_Interwell_POOLED-Upgradient	1	139
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1

group	D_x_ols	x_ols
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	1
Beryllium [ug/L]_Interwell_POOLED-Upgradient	0	2
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Cadmium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	4.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.7
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.7
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	3.7
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	25.1
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	4.3
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	1.6
Chromium [ug/L]_Interwell_POOLED-Upgradient	0	1.5
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.3
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	3.3
Chromium [ug/L]_Interwell_POOLED-Upgradient	1	2.67
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.3
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	2.5
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	1
Cobalt [ug/L]_Interwell_POOLED-Upgradient	1	1.2
Cobalt [ug/L]_Interwell_POOLED-Upgradient	0	2
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	15.8
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	15
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	14.9

group	D_x_ols	x_ols
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	16.1
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	14
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	13
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	10.1
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	10.2
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	13.3
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	11.1
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	8.5
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	9.9
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	16.5
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	9
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	15
Selenium [ug/L]_Interwell_POOLED-Upgradient	1	10.5
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	50.3820988
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	45.6333195
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	41.26781541
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	43.50231131
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	37.43680722
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	34.53855108
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	22.70649658
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	20.84099248
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	69.19996748
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	41.33864865
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	33.7762835
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	31.98012
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	41.60521532
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	28.02682292
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	34.01428339
Molybdenum [ug/L]_Interwell_POOLED-Upgradient	1	33.2
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	6.5
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	3.4
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	2.9
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	2
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	2
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	2.6
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	3.9
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	3
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	4.5
Nickel [ug/L]_Interwell_POOLED-Upgradient	1	5.1
Boron [mg/L]_Interwell_POOLED-Upgradient	1	1.116938204
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.918510015
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.889530787
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.990551559
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.821572331
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.50810349
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.150226339
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.025
Boron [mg/L]_Interwell_POOLED-Upgradient	1	1.586296422
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.729991974
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.450768831
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.484137379
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.790037977
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.532876259
Boron [mg/L]_Interwell_POOLED-Upgradient	1	0.559
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	101
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	105
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	89.4
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	97.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	107
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	107
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	113
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	113
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	97.8
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	108
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	102

group	D_x_ols	x_ols
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	100
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	97.5
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	87.9
Calcium [mg/L]_Interwell_POOLED-Upgradient	1	124
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Mercury [ug/L]_Interwell_POOLED-Upgradient	0	0.2
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	75.76376116
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	66.21946786
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	59.65347424
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	71.08748063
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	58.52148701
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	52.17249658
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	51.6499036
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	45.08390999
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	81.54401681
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	72.54044617
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	59.14626978
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	54.57849085
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	60.72503713
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	63.56956425
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	53.11028691
Sulfate [mg/L]_Interwell_POOLED-Upgradient	1	50.9
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.31
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.33
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.31
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.42
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.32
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.33
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.25
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.2
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.41
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.51
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.34
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.21
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.39
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.56
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	7.31
pH, Lab [SU]_Interwell_POOLED-Upgradient	1	8.17
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	171.0376639
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	181.1189637
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	171.1963921
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	161.2738205
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	171.3512488
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	161.4673914
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	161.5525627
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	151.6299911
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	197.7778052
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	168.1339758
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	168.4204608
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	148.6759745
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	159.2373304

group	D_x_ols	x_ols
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	149.566401
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	179.8412718
Fluoride [ug/L]_Interwell_POOLED-Upgradient	1	170
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	12
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	10
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	12
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	10
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	10
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	12
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	9
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	11
Chloride [mg/L]_Interwell_POOLED-Upgradient	1	9.21
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	372
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	324
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	366
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	392
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	278
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	348
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	424
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	380
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	372
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	360
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	386
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	372
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	380
Dissolved Solids, Total [mg/L]_Interwell_POOLED-Upgradient	1	354
Iron [mg/L]_Interwell_POOLED-Upgradient	1	0.563
Iron [mg/L]_Interwell_POOLED-Upgradient	1	0.709
Manganese [mg/L]_Interwell_POOLED-Upgradient	1	0.192
Manganese [mg/L]_Interwell_POOLED-Upgradient	1	0.21
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	19.1
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	18.3
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	26.5
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	37.3
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	38.7
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	21.6
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	22.8
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	29.8
Iron [mg/L]_Interwell_POOLED-Upgradient	1	1.42
Iron [mg/L]_Interwell_POOLED-Upgradient	1	0.405
Manganese [mg/L]_Interwell_POOLED-Upgradient	1	0.139
Manganese [mg/L]_Interwell_POOLED-Upgradient	1	0.0791
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	33.9
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	31.7
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	31.7
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	89.5
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	83.2
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	133
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	95.6
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	25.6
Iron [mg/L]_Interwell_POOLED-Upgradient	1	0.496
Iron [mg/L]_Interwell_POOLED-Upgradient	1	0.179
Manganese [mg/L]_Interwell_POOLED-Upgradient	1	0.599
Manganese [mg/L]_Interwell_POOLED-Upgradient	1	0.124
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	34.2
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	7.3
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	7.28
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	23.6

group	D_x_ols	x_ols
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	24.7
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	5.64
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	3.82
Turbidity, Field [NTU]_Interwell_POOLED-Upgradient	1	13.4

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (antimony [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	2	Number of Non-Detects	14
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	2.1	Maximum Non-Detect	4
Variance Detects	0.605	Percent Non-Detects	87.5%
Mean Detects	1.55	SD Detects	0.778
Median Detects	1.55	CV Detects	0.502
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.371	SD of Logged Detects	0.525

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	1.073	KM Standard Error of Mean	0.1
90KM SD	0.274	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.249	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.238	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.374	95% KM Chebyshev UCL	1.51
97.5% KM Chebyshev UCL	1.699	99% KM Chebyshev UCL	2.07

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	7.594	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.204	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	30.38	nu star (bias corrected)	N/A
Mean (detects)	1.55		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.073	SD (KM)	0.274
Variance (KM)	0.0753	SE of Mean (KM)	0.1
k hat (KM)	15.3	k star (KM)	12.47
nu hat (KM)	489.7	nu star (KM)	399.2
theta hat (KM)	0.0701	theta star (KM)	0.086
80% gamma percentile (KM)	1.317	90% gamma percentile (KM)	1.477
95% gamma percentile (KM)	1.617	99% gamma percentile (KM)	1.904

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0335
Approximate Chi Square Value (399.18, α)	353.9	Adjusted Chi Square Value (399.18, β)	349
95% KM Approximate Gamma UCL	1.211	95% KM Adjusted Gamma UCL	1.228

Lognormal GOF Test on Detected Observations Only

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.268	Mean in Log Scale	-2.801
SD in Original Scale	0.548	SD in Log Scale	1.841
95% t UCL (assumes normality of ROS data)	0.508	95% Percentile Bootstrap UCL	0.513
95% BCA Bootstrap UCL	0.631	95% Bootstrap t UCL	1.372
95% H-UCL (Log ROS)	2.405		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0495	KM Geo Mean	1.051
KM SD (logged)	0.185	95% Critical H Value (KM-Log)	1.791
KM Standard Error of Mean (logged)	0.0676	95% H-UCL (KM -Log)	1.164
KM SD (logged)	0.185	95% Critical H Value (KM-Log)	1.791
KM Standard Error of Mean (logged)	0.0676		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.725	Mean in Log Scale	-0.473
SD in Original Scale	0.532	SD in Log Scale	0.496
95% t UCL (Assumes normality)	0.958	95% H-Stat UCL	0.915

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

Suggested UCL to Use

95% KM (t) UCL	1.249

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (antimony [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (antimony [ug/l]_intrawell_apw-03) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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 report_result_value (antimony [ug/l]_intrawell_apw-05/05r) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	15
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 report_result_value (antimony [ug/l]_intrawell_apw-06d) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (antimony [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (antimony [ug/l]_intrawell_apw-07) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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 report_result_value (antimony [ug/l]_intrawell_apw-08) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (antimony [ug/l]_intrawell_apw-10d) was not processed!

report_result_value (antimony [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (antimony [ug/l]_intrawell_apw-10s) was not processed!

report_result_value (arsenic [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	9.3	Mean	17.86
Maximum	26	Median	16.95
SD	4.702	Std. Error of Mean	1.175
Coefficient of Variation	0.263	Skewness	0.0647

Normal GOF Test

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.135	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Normal Distribution

95% Normal UCL

95% Student's-t UCL	19.92

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	19.82
95% Modified-t UCL (Johnson-1978)	19.93

Gamma GOF Test

A-D Test Statistic	0.26	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.14	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.49	k star (bias corrected MLE)	11.81
Theta hat (MLE)	1.233	Theta star (bias corrected MLE)	1.512
nu hat (MLE)	463.7	nu star (bias corrected)	378.1
MLE Mean (bias corrected)	17.86	MLE Sd (bias corrected)	5.197
		Approximate Chi Square Value (0.05)	334
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	329.3

Assuming Gamma Distribution

95% Approximate Gamma UCL	20.22	95% Adjusted Gamma UCL	20.51

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.159	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.23	Mean of logged Data	2.848
Maximum of Logged Data	3.258	SD of logged Data	0.279

Assuming Lognormal Distribution

95% H-UCL	20.51	90% Chebyshev (MVUE) UCL	21.68
95% Chebyshev (MVUE) UCL	23.4	97.5% Chebyshev (MVUE) UCL	25.78
99% Chebyshev (MVUE) UCL	30.46		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	19.8	95% BCA Bootstrap UCL	19.87
95% Standard Bootstrap UCL	19.78	95% Bootstrap-t UCL	20.13
95% Hall's Bootstrap UCL	19.92	95% Percentile Bootstrap UCL	19.78
90% Chebyshev(Mean, Sd) UCL	21.39	95% Chebyshev(Mean, Sd) UCL	22.99
97.5% Chebyshev(Mean, Sd) UCL	25.2	99% Chebyshev(Mean, Sd) UCL	29.56

Suggested UCL to Use

95% Student's-t UCL	19.92

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 using results from simulation studies.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (arsenic [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
Number of Detects	15	Number of Non-Detects	1
Number of Distinct Detects	13	Number of Distinct Non-Detects	1
Minimum Detect	1.7	Minimum Non-Detect	2
Maximum Detect	5.9	Maximum Non-Detect	2
Variance Detects	1.434	Percent Non-Detects	6.25%
Mean Detects	2.767	SD Detects	1.197
Median Detects	2.3	CV Detects	0.433
Skewness Detects	1.645	Kurtosis Detects	2.33
Mean of Logged Detects	0.947	SD of Logged Detects	0.369

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.804	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.223	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Detected Data appear Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.704	KM Standard Error of Mean	0.297
90KM SD	1.146	95% KM (BCA) UCL	3.269
95% KM (t) UCL	3.224	95% KM (Percentile Bootstrap) UCL	3.213
95% KM (z) UCL	3.192	95% KM Bootstrap t UCL	3.504
90% KM Chebyshev UCL	3.594	95% KM Chebyshev UCL	3.997
97.5% KM Chebyshev UCL	4.556	99% KM Chebyshev UCL	5.655

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.778	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.738	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.199	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.222	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)	7.284	k star (bias corrected MLE)	5.872
Theta hat (MLE)	0.38	Theta star (bias corrected MLE)	0.471
nu hat (MLE)	218.5	nu star (bias corrected)	176.2
Mean (detects)	2.767		

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	1.331	Mean	2.677
Maximum	5.9	Median	2.25
SD	1.211	CV	0.452
k hat (MLE)	6.524	k star (bias corrected MLE)	5.342

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Theta hat (MLE)	0.41	Theta star (bias corrected MLE)	0.501
nu hat (MLE)	208.8	nu star (bias corrected)	171
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (170.96, α)	141.7	Adjusted Chi Square Value (170.96, β)	138.7
95% Gamma Approximate UCL	3.229	95% Gamma Adjusted UCL	3.3

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.704	SD (KM)	1.146
Variance (KM)	1.313	SE of Mean (KM)	0.297
k hat (KM)	5.568	k star (KM)	4.566
nu hat (KM)	178.2	nu star (KM)	146.1
theta hat (KM)	0.486	theta star (KM)	0.592
80% gamma percentile (KM)	3.672	90% gamma percentile (KM)	4.399
95% gamma percentile (KM)	5.065	99% gamma percentile (KM)	6.477

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (146.10, α)	119.2	Adjusted Chi Square Value (146.10, β)	116.4
95% KM Approximate Gamma UCL	3.315	95% KM Adjusted Gamma UCL	3.394

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.693	Mean in Log Scale	0.917
SD in Original Scale	1.194	SD in Log Scale	0.376
95% t UCL (assumes normality of ROS data)	3.216	95% Percentile Bootstrap UCL	3.186
95% BCA Bootstrap UCL	3.294	95% Bootstrap t UCL	3.562
95% H-UCL (Log ROS)	3.24		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.924	KM Geo Mean	2.519
KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.917
KM Standard Error of Mean (logged)	0.0924	95% H-UCL (KM -Log)	3.203
KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.917
KM Standard Error of Mean (logged)	0.0924		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.656	Mean in Log Scale	0.888
SD in Original Scale	1.238	SD in Log Scale	0.428
95% t UCL (Assumes normality)	3.199	95% H-Stat UCL	3.315

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 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3.224

When a data set follows an approximate distribution passing only one of the GOF tests,

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (arsenic [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	1.5	Mean	2.525
Maximum	4.8	Median	2.3
SD	0.915	Std. Error of Mean	0.229
Coefficient of Variation	0.363	Skewness	1.341

Normal GOF Test

Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.155	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.926	95% Adjusted-CLT UCL (Chen-1995)	2.983
		95% Modified-t UCL (Johnson-1978)	2.939

Gamma GOF Test

A-D Test Statistic	0.37	**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	0.12	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.453	k star (bias corrected MLE)	7.722
Theta hat (MLE)	0.267	Theta star (bias corrected MLE)	0.327
nu hat (MLE)	302.5	nu star (bias corrected)	247.1
MLE Mean (bias corrected)	2.525	MLE Sd (bias corrected)	0.909
		Approximate Chi Square Value (0.05)	211.7
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	208

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.947	95% Adjusted Gamma UCL	3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.1	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal Statistics

Minimum of Logged Data	0.405	Mean of logged Data	0.872
Maximum of Logged Data	1.569	SD of logged Data	0.33

Assuming Lognormal Distribution

95% H-UCL	2.969	90% Chebyshev (MVUE) UCL	3.149
95% Chebyshev (MVUE) UCL	3.436	97.5% Chebyshev (MVUE) UCL	3.833
99% Chebyshev (MVUE) UCL	4.613		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.901	95% BCA Bootstrap UCL	3.006
95% Standard Bootstrap UCL	2.886	95% Bootstrap-t UCL	3.09
95% Hall's Bootstrap UCL	3.3	95% Percentile Bootstrap UCL	2.894
90% Chebyshev(Mean, Sd) UCL	3.212	95% Chebyshev(Mean, Sd) UCL	3.523
97.5% Chebyshev(Mean, Sd) UCL	3.954	99% Chebyshev(Mean, Sd) UCL	4.802

Suggested UCL to Use

95% Student's-t UCL	2.926

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (arsenic [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	6.8	Mean	9.92
Maximum	13.5	Median	10.2
SD	1.735	Std. Error of Mean	0.448
Coefficient of Variation	0.175	Skewness	-0.128

Normal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	10.71	95% Adjusted-CLT UCL (Chen-1995)	10.64
		95% Modified-t UCL (Johnson-1978)	10.71

Gamma GOF Test

A-D Test Statistic	0.522	**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	0.164	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	33.33	k star (bias corrected MLE)	26.71
Theta hat (MLE)	0.298	Theta star (bias corrected MLE)	0.371
nu hat (MLE)	999.9	nu star (bias corrected)	801.3
MLE Mean (bias corrected)	9.92	MLE Sd (bias corrected)	1.919
		Approximate Chi Square Value (0.05)	736.6
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	729

Assuming Gamma Distribution

95% Approximate Gamma UCL	10.79	95% Adjusted Gamma UCL	10.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.917	Mean of logged Data	2.279
Maximum of Logged Data	2.603	SD of logged Data	0.183

Assuming Lognormal Distribution

95% H-UCL	10.85	90% Chebyshev (MVUE) UCL	11.34
95% Chebyshev (MVUE) UCL	11.97	97.5% Chebyshev (MVUE) UCL	12.86
99% Chebyshev (MVUE) UCL	14.6		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	10.66	95% BCA Bootstrap UCL	10.61
95% Standard Bootstrap UCL	10.64	95% Bootstrap-t UCL	10.7
95% Hall's Bootstrap UCL	10.7	95% Percentile Bootstrap UCL	10.63
90% Chebyshev(Mean, Sd) UCL	11.26	95% Chebyshev(Mean, Sd) UCL	11.87
97.5% Chebyshev(Mean, Sd) UCL	12.72	99% Chebyshev(Mean, Sd) UCL	14.38

Suggested UCL to Use

95% Student's-t UCL	10.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (arsenic [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
Number of Detects	14	Number of Non-Detects	2

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	2	Maximum Non-Detect	2
Variance Detects	0.106	Percent Non-Detects	12.5%
Mean Detects	1.35	SD Detects	0.325
Median Detects	1.2	CV Detects	0.241
Skewness Detects	0.775	Kurtosis Detects	-0.717
Mean of Logged Detects	0.275	SD of Logged Detects	0.23

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.825	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.263	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.324	KM Standard Error of Mean	0.0831
90KM SD	0.313	95% KM (BCA) UCL	1.469
95% KM (t) UCL	1.469	95% KM (Percentile Bootstrap) UCL	1.469
95% KM (z) UCL	1.46	95% KM Bootstrap t UCL	1.505
90% KM Chebyshev UCL	1.573	95% KM Chebyshev UCL	1.686
97.5% KM Chebyshev UCL	1.842	99% KM Chebyshev UCL	2.15

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.722	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.228	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)	19.9	k star (bias corrected MLE)	15.69
Theta hat (MLE)	0.0678	Theta star (bias corrected MLE)	0.0861
nu hat (MLE)	557.3	nu star (bias corrected)	439.2
Mean (detects)	1.35		

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	0.709	Mean	1.304
Maximum	2	Median	1.2
SD	0.343	CV	0.263
k hat (MLE)	15.63	k star (bias corrected MLE)	12.74
Theta hat (MLE)	0.0834	Theta star (bias corrected MLE)	0.102
nu hat (MLE)	500.2	nu star (bias corrected)	407.8
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (407.75, α)	361.9	Adjusted Chi Square Value (407.75, β)	357
95% Gamma Approximate UCL	1.469	95% Gamma Adjusted UCL	1.489

Estimates of Gamma Parameters using KM Estimates

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mean (KM)	1.324	SD (KM)	0.313
Variance (KM)	0.0977	SE of Mean (KM)	0.0831
k hat (KM)	17.93	k star (KM)	14.61
nu hat (KM)	573.9	nu star (KM)	467.6
theta hat (KM)	0.0738	theta star (KM)	0.0906
80% gamma percentile (KM)	1.603	90% gamma percentile (KM)	1.782
95% gamma percentile (KM)	1.94	99% gamma percentile (KM)	2.259

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (467.60, α)	418.5	Adjusted Chi Square Value (467.60, β)	413.2
95% KM Approximate Gamma UCL	1.479	95% KM Adjusted Gamma UCL	1.498

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.895	Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.228	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.208	Detected Data Not Lognormal at 10% Significance Level	

Detected Data appear Approximate Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.307	Mean in Log Scale	0.238
SD in Original Scale	0.335	SD in Log Scale	0.251
95% t UCL (assumes normality of ROS data)	1.454	95% Percentile Bootstrap UCL	1.444
95% BCA Bootstrap UCL	1.446	95% Bootstrap t UCL	1.476
95% H-UCL (Log ROS)	1.475		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.255	KM Geo Mean	1.29
KM SD (logged)	0.223	95% Critical H Value (KM-Log)	1.815
KM Standard Error of Mean (logged)	0.0595	95% H-UCL (KM -Log)	1.468
KM SD (logged)	0.223	95% Critical H Value (KM-Log)	1.815
KM Standard Error of Mean (logged)	0.0595		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.275	Mean in Log Scale	0.197
SD in Original Scale	0.377	SD in Log Scale	0.327
95% t UCL (Assumes normality)	1.44	95% H-Stat UCL	1.507

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.469

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (arsenic [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Number of Detects	9	Number of Non-Detects	7
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	2.3	Maximum Non-Detect	2
Variance Detects	0.178	Percent Non-Detects	43.75%
Mean Detects	1.6	SD Detects	0.421
Median Detects	1.4	CV Detects	0.263
Skewness Detects	0.761	Kurtosis Detects	-0.625
Mean of Logged Detects	0.441	SD of Logged Detects	0.254

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.764	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.238	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.316	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.351	KM Standard Error of Mean	0.112
90KM SD	0.418	95% KM (BCA) UCL	1.525
95% KM (t) UCL	1.548	95% KM (Percentile Bootstrap) UCL	1.531
95% KM (z) UCL	1.536	95% KM Bootstrap t UCL	1.591
90% KM Chebyshev UCL	1.689	95% KM Chebyshev UCL	1.841
97.5% KM Chebyshev UCL	2.053	99% KM Chebyshev UCL	2.47

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.395	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.233	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	17.22	k star (bias corrected MLE)	11.56
Theta hat (MLE)	0.0929	Theta star (bias corrected MLE)	0.138
nu hat (MLE)	310	nu star (bias corrected)	208
Mean (detects)	1.6		

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	0.353	Mean	1.225
Maximum	2.3	Median	1.15
SD	0.559	CV	0.456
k hat (MLE)	4.696	k star (bias corrected MLE)	3.857
Theta hat (MLE)	0.261	Theta star (bias corrected MLE)	0.318
nu hat (MLE)	150.3	nu star (bias corrected)	123.4
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (123.43, α)	98.77	Adjusted Chi Square Value (123.43, β)	96.27

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Gamma Approximate UCL	1.531	95% Gamma Adjusted UCL	1.571

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.351	SD (KM)	0.418
Variance (KM)	0.175	SE of Mean (KM)	0.112
k hat (KM)	10.43	k star (KM)	8.517
nu hat (KM)	333.8	nu star (KM)	272.5
theta hat (KM)	0.13	theta star (KM)	0.159
80% gamma percentile (KM)	1.718	90% gamma percentile (KM)	1.968
95% gamma percentile (KM)	2.192	99% gamma percentile (KM)	2.654

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (272.54, α)	235.3	Adjusted Chi Square Value (272.54, β)	231.4
95% KM Approximate Gamma UCL	1.565	95% KM Adjusted Gamma UCL	1.592

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.252	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.285	Mean in Log Scale	0.184
SD in Original Scale	0.493	SD in Log Scale	0.375
95% t UCL (assumes normality of ROS data)	1.5	95% Percentile Bootstrap UCL	1.481
95% BCA Bootstrap UCL	1.494	95% Bootstrap t UCL	1.539
95% H-UCL (Log ROS)	1.555		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.259	KM Geo Mean	1.296
KM SD (logged)	0.281	95% Critical H Value (KM-Log)	1.856
KM Standard Error of Mean (logged)	0.0757	95% H-UCL (KM -Log)	1.542
KM SD (logged)	0.281	95% Critical H Value (KM-Log)	1.856
KM Standard Error of Mean (logged)	0.0757		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.15	Mean in Log Scale	-0.012
SD in Original Scale	0.622	SD in Log Scale	0.586
95% t UCL (Assumes normality)	1.423	95% H-Stat UCL	1.622

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.548

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (arsenic [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
Number of Detects	9	Number of Non-Detects	7
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	2.5	Maximum Non-Detect	2
Variance Detects	0.236	Percent Non-Detects	43.75%
Mean Detects	1.711	SD Detects	0.486
Median Detects	1.7	CV Detects	0.284
Skewness Detects	0.0477	Kurtosis Detects	-0.493
Mean of Logged Detects	0.499	SD of Logged Detects	0.301

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.764	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.118	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.316	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.414	KM Standard Error of Mean	0.132
90KM SD	0.49	95% KM (BCA) UCL	1.631
95% KM (t) UCL	1.645	95% KM (Percentile Bootstrap) UCL	1.625
95% KM (z) UCL	1.631	95% KM Bootstrap t UCL	1.663
90% KM Chebyshev UCL	1.809	95% KM Chebyshev UCL	1.988
97.5% KM Chebyshev UCL	2.236	99% KM Chebyshev UCL	2.724

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.209	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.141	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	13.13	k star (bias corrected MLE)	8.824
Theta hat (MLE)	0.13	Theta star (bias corrected MLE)	0.194
nu hat (MLE)	236.3	nu star (bias corrected)	158.8
Mean (detects)	1.711		

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	0.303	Mean	1.281
Maximum	2.5	Median	1.083
SD	0.639	CV	0.499
k hat (MLE)	3.785	k star (bias corrected MLE)	3.117

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Theta hat (MLE)	0.338	Theta star (bias corrected MLE)	0.411
nu hat (MLE)	121.1	nu star (bias corrected)	99.75
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (99.75, α)	77.71	Adjusted Chi Square Value (99.75, β)	75.49
95% Gamma Approximate UCL	1.644	95% Gamma Adjusted UCL	1.693

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.414	SD (KM)	0.49
Variance (KM)	0.24	SE of Mean (KM)	0.132
k hat (KM)	8.326	k star (KM)	6.806
nu hat (KM)	266.4	nu star (KM)	217.8
theta hat (KM)	0.17	theta star (KM)	0.208
80% gamma percentile (KM)	1.839	90% gamma percentile (KM)	2.138
95% gamma percentile (KM)	2.407	99% gamma percentile (KM)	2.969

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (217.80, α)	184.6	Adjusted Chi Square Value (217.80, β)	181.2
95% KM Approximate Gamma UCL	1.668	95% KM Adjusted Gamma UCL	1.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.156	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.252	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.334	Mean in Log Scale	0.2
SD in Original Scale	0.578	SD in Log Scale	0.436
95% t UCL (assumes normality of ROS data)	1.587	95% Percentile Bootstrap UCL	1.567
95% BCA Bootstrap UCL	1.584	95% Bootstrap t UCL	1.631
95% H-UCL (Log ROS)	1.68		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.291	KM Geo Mean	1.338
KM SD (logged)	0.325	95% Critical H Value (KM-Log)	1.891
KM Standard Error of Mean (logged)	0.0877	95% H-UCL (KM -Log)	1.653
KM SD (logged)	0.325	95% Critical H Value (KM-Log)	1.891
KM Standard Error of Mean (logged)	0.0877		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.213	Mean in Log Scale	0.0205
SD in Original Scale	0.694	SD in Log Scale	0.624
95% t UCL (Assumes normality)	1.517	95% H-Stat UCL	1.764

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.645

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (arsenic [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
Number of Detects	8	Number of Non-Detects	8
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	5.7	Maximum Non-Detect	2
Variance Detects	2.18	Percent Non-Detects	50%
Mean Detects	2.138	SD Detects	1.476
Median Detects	1.7	CV Detects	0.691
Skewness Detects	2.545	Kurtosis Detects	6.876
Mean of Logged Detects	0.624	SD of Logged Detects	0.503

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.637	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.585	KM Standard Error of Mean	0.302
90KM SD	1.127	95% KM (BCA) UCL	2.15
95% KM (t) UCL	2.114	95% KM (Percentile Bootstrap) UCL	2.111
95% KM (z) UCL	2.082	95% KM Bootstrap t UCL	2.794
90% KM Chebyshev UCL	2.491	95% KM Chebyshev UCL	2.901
97.5% KM Chebyshev UCL	3.471	99% KM Chebyshev UCL	4.59

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.941	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.719	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.321	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.295	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)	3.845	k star (bias corrected MLE)	2.486
Theta hat (MLE)	0.556	Theta star (bias corrected MLE)	0.86
nu hat (MLE)	61.52	nu star (bias corrected)	39.78
Mean (detects)	2.138		

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	1.127
Maximum	5.7	Median	0.718

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD	1.456	CV	1.292
k hat (MLE)	0.432	k star (bias corrected MLE)	0.393
Theta hat (MLE)	2.607	Theta star (bias corrected MLE)	2.869
nu hat (MLE)	13.84	nu star (bias corrected)	12.57
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (12.57, α)	5.608	Adjusted Chi Square Value (12.57, β)	5.087
95% Gamma Approximate UCL	2.528	95% Gamma Adjusted UCL	2.786

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.585	SD (KM)	1.127
Variance (KM)	1.27	SE of Mean (KM)	0.302
k hat (KM)	1.977	k star (KM)	1.648
nu hat (KM)	63.27	nu star (KM)	52.74
theta hat (KM)	0.801	theta star (KM)	0.961
80% gamma percentile (KM)	2.426	90% gamma percentile (KM)	3.227
95% gamma percentile (KM)	4.001	99% gamma percentile (KM)	5.737

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (52.74, α)	37.06	Adjusted Chi Square Value (52.74, β)	35.57
95% KM Approximate Gamma UCL	2.255	95% KM Adjusted Gamma UCL	2.35

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.851	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.282	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.265	Detected Data Not Lognormal at 10% Significance Level

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.385	Mean in Log Scale	0.0519
SD in Original Scale	1.282	SD in Log Scale	0.733
95% t UCL (assumes normality of ROS data)	1.947	95% Percentile Bootstrap UCL	1.922
95% BCA Bootstrap UCL	2.213	95% Bootstrap t UCL	2.429
95% H-UCL (Log ROS)	2.138		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.324	KM Geo Mean	1.383
KM SD (logged)	0.455	95% Critical H Value (KM-Log)	2.005
KM Standard Error of Mean (logged)	0.123	95% H-UCL (KM -Log)	1.94
KM SD (logged)	0.455	95% Critical H Value (KM-Log)	2.005
KM Standard Error of Mean (logged)	0.123		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.35	Mean in Log Scale	0.00875
SD in Original Scale	1.301	SD in Log Scale	0.742
95% t UCL (Assumes normality)	1.92	95% H-Stat UCL	2.076

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

Suggested UCL to Use

95% KM (t) UCL	2.114

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (arsenic [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	174	Mean	197.1
Maximum	276	Median	190
SD	24.77	Std. Error of Mean	6.193
Coefficient of Variation	0.126	Skewness	2.51

Normal GOF Test

Shapiro Wilk Test Statistic	0.704	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.297	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	207.9	95% Adjusted-CLT UCL (Chen-1995)	211.4
		95% Modified-t UCL (Johnson-1978)	208.6

Gamma GOF Test

A-D Test Statistic	1.527	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.281	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	78.71	k star (bias corrected MLE)	63.99
Theta hat (MLE)	2.504	Theta star (bias corrected MLE)	3.079
nu hat (MLE)	2519	nu star (bias corrected)	2048
MLE Mean (bias corrected)	197.1	MLE Sd (bias corrected)	24.63
		Approximate Chi Square Value (0.05)	1944
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1932

Assuming Gamma Distribution

95% Approximate Gamma UCL	207.6	95% Adjusted Gamma UCL	208.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.758	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.273	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Minimum of Logged Data	5.159	Mean of logged Data	5.277
Maximum of Logged Data	5.62	SD of logged Data	0.112

Assuming Lognormal Distribution

95% H-UCL	207.3	90% Chebyshev (MVUE) UCL	213.6
95% Chebyshev (MVUE) UCL	221.1	97.5% Chebyshev (MVUE) UCL	231.6
99% Chebyshev (MVUE) UCL	252.1		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	207.2	95% BCA Bootstrap UCL	211.1
95% Standard Bootstrap UCL	206.9	95% Bootstrap-t UCL	222.7
95% Hall's Bootstrap UCL	257.1	95% Percentile Bootstrap UCL	207.7
90% Chebyshev(Mean, Sd) UCL	215.6	95% Chebyshev(Mean, Sd) UCL	224.1
97.5% Chebyshev(Mean, Sd) UCL	235.7	99% Chebyshev(Mean, Sd) UCL	258.7

Suggested UCL to Use

95% Student's-t UCL	207.9

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (barium [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	149	Mean	355.4
Maximum	739	Median	344.5
SD	174.7	Std. Error of Mean	43.67
Coefficient of Variation	0.491	Skewness	0.92

Normal GOF Test

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.127	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	431.9	95% Adjusted-CLT UCL (Chen-1995)	437.9
		95% Modified-t UCL (Johnson-1978)	433.6

Gamma GOF Test

A-D Test Statistic	0.262	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.107	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.216	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma Statistics

k hat (MLE)	4.611	k star (bias corrected MLE)	3.788
Theta hat (MLE)	77.06	Theta star (bias corrected MLE)	93.8
nu hat (MLE)	147.6	nu star (bias corrected)	121.2
MLE Mean (bias corrected)	355.4	MLE Sd (bias corrected)	182.6
		Approximate Chi Square Value (0.05)	96.8
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	94.32

Assuming Gamma Distribution

95% Approximate Gamma UCL	445	95% Adjusted Gamma UCL	456.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.114	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.004	Mean of logged Data	5.761
Maximum of Logged Data	6.605	SD of logged Data	0.495

Assuming Lognormal Distribution

95% H-UCL	466.4	90% Chebyshev (MVUE) UCL	492.4
95% Chebyshev (MVUE) UCL	554.2	97.5% Chebyshev (MVUE) UCL	639.9
99% Chebyshev (MVUE) UCL	808.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	427.2	95% BCA Bootstrap UCL	434.6
95% Standard Bootstrap UCL	425.3	95% Bootstrap-t UCL	460.2
95% Hall's Bootstrap UCL	484.3	95% Percentile Bootstrap UCL	424.1
90% Chebyshev(Mean, Sd) UCL	486.4	95% Chebyshev(Mean, Sd) UCL	545.7
97.5% Chebyshev(Mean, Sd) UCL	628.1	99% Chebyshev(Mean, Sd) UCL	789.8

Suggested UCL to Use

95% Student's-t UCL	431.9

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (barium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	80.6	Mean	133.8
Maximum	190	Median	136
SD	33.02	Std. Error of Mean	8.255

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Coefficient of Variation	0.247	Skewness	-0.0492

Normal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.0822	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	148.2	95% Adjusted-CLT UCL (Chen-1995)	147.2
		95% Modified-t UCL (Johnson-1978)	148.2

Gamma GOF Test

A-D Test Statistic	0.223	**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	0.11	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	16.47	k star (bias corrected MLE)	13.43
Theta hat (MLE)	8.12	Theta star (bias corrected MLE)	9.963
nu hat (MLE)	527.1	nu star (bias corrected)	429.6
MLE Mean (bias corrected)	133.8	MLE Sd (bias corrected)	36.5
		Approximate Chi Square Value (0.05)	382.6
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	377.5

Assuming Gamma Distribution

95% Approximate Gamma UCL	150.2	95% Adjusted Gamma UCL	152.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.389	Mean of logged Data	4.865
Maximum of Logged Data	5.247	SD of logged Data	0.261

Assuming Lognormal Distribution

95% H-UCL	152	90% Chebyshev (MVUE) UCL	160.4
95% Chebyshev (MVUE) UCL	172.4	97.5% Chebyshev (MVUE) UCL	189
99% Chebyshev (MVUE) UCL	221.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	147.3	95% BCA Bootstrap UCL	146.8
95% Standard Bootstrap UCL	146.9	95% Bootstrap-t UCL	148

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Hall's Bootstrap UCL	147.2	95% Percentile Bootstrap UCL	147.1
90% Chebyshev(Mean, Sd) UCL	158.5	95% Chebyshev(Mean, Sd) UCL	169.7
97.5% Chebyshev(Mean, Sd) UCL	185.3	99% Chebyshev(Mean, Sd) UCL	215.9

Suggested UCL to Use

95% Student's-t UCL	148.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (barium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	140	Mean	188.8
Maximum	233	Median	190
SD	31.03	Std. Error of Mean	7.757
Coefficient of Variation	0.164	Skewness	-0.201

Normal GOF Test

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.167	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	202.4	95% Adjusted-CLT UCL (Chen-1995)	201.2
		95% Modified-t UCL (Johnson-1978)	202.3

Gamma GOF Test

A-D Test Statistic	0.491	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.175	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	38.05	k star (bias corrected MLE)	30.95
Theta hat (MLE)	4.963	Theta star (bias corrected MLE)	6.1
nu hat (MLE)	1217	nu star (bias corrected)	990.5
MLE Mean (bias corrected)	188.8	MLE Sd (bias corrected)	33.94
		Approximate Chi Square Value (0.05)	918.5
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	910.6

Assuming Gamma Distribution

95% Approximate Gamma UCL	203.6	95% Adjusted Gamma UCL	205.4

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.168	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.942	Mean of logged Data	5.228
Maximum of Logged Data	5.451	SD of logged Data	0.17

Assuming Lognormal Distribution

95% H-UCL	204.4	90% Chebyshev (MVUE) UCL	213
95% Chebyshev (MVUE) UCL	223.9	97.5% Chebyshev (MVUE) UCL	239.1
99% Chebyshev (MVUE) UCL	268.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	201.6	95% BCA Bootstrap UCL	200.2
95% Standard Bootstrap UCL	201.2	95% Bootstrap-t UCL	202
95% Hall's Bootstrap UCL	200.8	95% Percentile Bootstrap UCL	200.9
90% Chebyshev(Mean, Sd) UCL	212.1	95% Chebyshev(Mean, Sd) UCL	222.6
97.5% Chebyshev(Mean, Sd) UCL	237.3	99% Chebyshev(Mean, Sd) UCL	266

Suggested UCL to Use

95% Student's-t UCL	202.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (barium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	115	Mean	148.7
Maximum	173	Median	148
SD	16.07	Std. Error of Mean	4.15
Coefficient of Variation	0.108	Skewness	-0.305

Normal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Normal Distribution

95% Normal UCL

95% Student's-t UCL	156

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	155.1
95% Modified-t UCL (Johnson-1978)	155.9

Gamma GOF Test

A-D Test Statistic	0.219
5% A-D Critical Value	0.734
K-S Test Statistic	0.147
5% K-S Critical Value	0.221

Anderson-Darling Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	88.73	k star (bias corrected MLE)	71.03
Theta hat (MLE)	1.676	Theta star (bias corrected MLE)	2.093
nu hat (MLE)	2662	nu star (bias corrected)	2131
MLE Mean (bias corrected)	148.7	MLE Sd (bias corrected)	17.64
		Approximate Chi Square Value (0.05)	2025
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	2012

Assuming Gamma Distribution

95% Approximate Gamma UCL	156.5	95% Adjusted Gamma UCL	157.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.959
10% Shapiro Wilk Critical Value	0.901
Lilliefors Test Statistic	0.159
10% Lilliefors Critical Value	0.202

Shapiro Wilk Lognormal GOF Test

Data appear Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.745	Mean of logged Data	4.996
Maximum of Logged Data	5.153	SD of logged Data	0.111

Assuming Lognormal Distribution

95% H-UCL	156.7	90% Chebyshev (MVUE) UCL	161.5
95% Chebyshev (MVUE) UCL	167.3	97.5% Chebyshev (MVUE) UCL	175.4
99% Chebyshev (MVUE) UCL	191.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	155.5	95% BCA Bootstrap UCL	154.7
95% Standard Bootstrap UCL	155.2	95% Bootstrap-t UCL	155.7
95% Hall's Bootstrap UCL	155.5	95% Percentile Bootstrap UCL	155.2
90% Chebyshev(Mean, Sd) UCL	161.1	95% Chebyshev(Mean, Sd) UCL	166.8
97.5% Chebyshev(Mean, Sd) UCL	174.6	99% Chebyshev(Mean, Sd) UCL	190

Suggested UCL to Use

95% Student's-t UCL	156

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (barium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	190	Mean	221.8
Maximum	305	Median	217.5
SD	26.64	Std. Error of Mean	6.661
Coefficient of Variation	0.12	Skewness	2.189

Normal GOF Test

Shapiro Wilk Test Statistic	0.787	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.249	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	233.4	95% Adjusted-CLT UCL (Chen-1995)	236.6
		95% Modified-t UCL (Johnson-1978)	234

Gamma GOF Test

A-D Test Statistic	0.913	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.229	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	83.73	k star (bias corrected MLE)	68.07
Theta hat (MLE)	2.648	Theta star (bias corrected MLE)	3.258
nu hat (MLE)	2679	nu star (bias corrected)	2178
MLE Mean (bias corrected)	221.8	MLE Sd (bias corrected)	26.88
		Approximate Chi Square Value (0.05)	2071
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2059

Assuming Gamma Distribution

95% Approximate Gamma UCL	233.3	95% Adjusted Gamma UCL	234.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.844	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.223	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal Statistics

Minimum of Logged Data	5.247	Mean of logged Data	5.396
Maximum of Logged Data	5.72	SD of logged Data	0.11

Assuming Lognormal Distribution

95% H-UCL	233	90% Chebyshev (MVUE) UCL	239.9
95% Chebyshev (MVUE) UCL	248.2	97.5% Chebyshev (MVUE) UCL	259.7
99% Chebyshev (MVUE) UCL	282.3		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	232.7	95% BCA Bootstrap UCL	235.8
95% Standard Bootstrap UCL	232.3	95% Bootstrap-t UCL	242.5
95% Hall's Bootstrap UCL	289.1	95% Percentile Bootstrap UCL	233.3
90% Chebyshev(Mean, Sd) UCL	241.7	95% Chebyshev(Mean, Sd) UCL	250.8
97.5% Chebyshev(Mean, Sd) UCL	263.3	99% Chebyshev(Mean, Sd) UCL	288

Suggested UCL to Use

95% Student's-t UCL	233.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (barium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	303	Mean	387.3
Maximum	522	Median	377
SD	53.83	Std. Error of Mean	13.46
Coefficient of Variation	0.139	Skewness	1.007

Normal GOF Test

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	410.8	95% Adjusted-CLT UCL (Chen-1995)	413
		95% Modified-t UCL (Johnson-1978)	411.4

Gamma GOF Test

A-D Test Statistic	0.777	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.212	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	58.33	k star (bias corrected MLE)	47.43
Theta hat (MLE)	6.639	Theta star (bias corrected MLE)	8.164
nu hat (MLE)	1867	nu star (bias corrected)	1518
MLE Mean (bias corrected)	387.3	MLE Sd (bias corrected)	56.23
		Approximate Chi Square Value (0.05)	1428
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1419

Assuming Gamma Distribution

95% Approximate Gamma UCL	411.5	95% Adjusted Gamma UCL	414.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.203	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.714	Mean of logged Data	5.95
Maximum of Logged Data	6.258	SD of logged Data	0.134

Assuming Lognormal Distribution

95% H-UCL	411.7	90% Chebyshev (MVUE) UCL	426.2
95% Chebyshev (MVUE) UCL	443.8	97.5% Chebyshev (MVUE) UCL	468.4
99% Chebyshev (MVUE) UCL	516.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	409.4	95% BCA Bootstrap UCL	411.1
95% Standard Bootstrap UCL	408.5	95% Bootstrap-t UCL	418.6
95% Hall's Bootstrap UCL	430.3	95% Percentile Bootstrap UCL	408.3
90% Chebyshev(Mean, Sd) UCL	427.6	95% Chebyshev(Mean, Sd) UCL	445.9
97.5% Chebyshev(Mean, Sd) UCL	471.3	99% Chebyshev(Mean, Sd) UCL	521.1

Suggested UCL to Use

95% Student's-t 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (barium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	167	Mean	214.3
Maximum	261	Median	218

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD	27.92	Std. Error of Mean	6.979
Coefficient of Variation	0.13	Skewness	-0.181

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.135	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	226.5	95% Adjusted-CLT UCL (Chen-1995)	225.5
		95% Modified-t UCL (Johnson-1978)	226.5

Gamma GOF Test

A-D Test Statistic	0.298	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	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	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	61.05	k star (bias corrected MLE)	49.64
Theta hat (MLE)	3.511	Theta star (bias corrected MLE)	4.317
nu hat (MLE)	1954	nu star (bias corrected)	1589
MLE Mean (bias corrected)	214.3	MLE Sd (bias corrected)	30.42
		Approximate Chi Square Value (0.05)	1497
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1487

Assuming Gamma Distribution

95% Approximate Gamma UCL	227.4	95% Adjusted Gamma UCL	229

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.159	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.118	Mean of logged Data	5.359
Maximum of Logged Data	5.565	SD of logged Data	0.134

Assuming Lognormal Distribution

95% H-UCL	227.9	90% Chebyshev (MVUE) UCL	235.9
95% Chebyshev (MVUE) UCL	245.6	97.5% Chebyshev (MVUE) UCL	259.1
99% Chebyshev (MVUE) UCL	285.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	225.8	95% BCA Bootstrap UCL	224.6

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Standard Bootstrap UCL	225.6	95% Bootstrap-t UCL	226.2
95% Hall's Bootstrap UCL	225.9	95% Percentile Bootstrap UCL	225.3
90% Chebyshev(Mean, Sd) UCL	235.2	95% Chebyshev(Mean, Sd) UCL	244.7
97.5% Chebyshev(Mean, Sd) UCL	257.9	99% Chebyshev(Mean, Sd) UCL	283.8

Suggested UCL to Use

95% Student's-t UCL	226.5

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (barium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	276	Mean	360.2
Maximum	485	Median	350
SD	58.91	Std. Error of Mean	14.73
Coefficient of Variation	0.164	Skewness	0.454

Normal GOF Test

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.115	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	386	95% Adjusted-CLT UCL (Chen-1995)	386.2
		95% Modified-t UCL (Johnson-1978)	386.3

Gamma GOF Test

A-D Test Statistic	0.184	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.101	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	40.67	k star (bias corrected MLE)	33.09
Theta hat (MLE)	8.856	Theta star (bias corrected MLE)	10.89
nu hat (MLE)	1301	nu star (bias corrected)	1059
MLE Mean (bias corrected)	360.2	MLE Sd (bias corrected)	62.62
		Approximate Chi Square Value (0.05)	984.3
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	976.1

Assuming Gamma Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Approximate Gamma UCL	387.5	95% Adjusted Gamma UCL	390.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.0952	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.62	Mean of logged Data	5.874
Maximum of Logged Data	6.184	SD of logged Data	0.162

Assuming Lognormal Distribution

95% H-UCL	388.2	90% Chebyshev (MVUE) UCL	404
95% Chebyshev (MVUE) UCL	423.9	97.5% Chebyshev (MVUE) UCL	451.5
99% Chebyshev (MVUE) UCL	505.7		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	384.4	95% BCA Bootstrap UCL	384.6
95% Standard Bootstrap UCL	382.8	95% Bootstrap-t UCL	388.1
95% Hall's Bootstrap UCL	386.6	95% Percentile Bootstrap UCL	382.4
90% Chebyshev(Mean, Sd) UCL	404.4	95% Chebyshev(Mean, Sd) UCL	424.4
97.5% Chebyshev(Mean, Sd) UCL	452.2	99% Chebyshev(Mean, Sd) UCL	506.7

Suggested UCL to Use

95% Student's-t UCL	386

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (barium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	536	Mean	611.8
Maximum	804	Median	594
SD	66.52	Std. Error of Mean	16.63
Coefficient of Variation	0.109	Skewness	1.824

Normal GOF Test

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Normal UCL

95% Student's-t UCL	640.9

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	647.2
95% Modified-t UCL (Johnson-1978)	642.2

Gamma GOF Test

A-D Test Statistic	0.851
5% A-D Critical Value	0.736
K-S Test Statistic	0.229
5% K-S Critical Value	0.214

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	99.4	k star (bias corrected MLE)	80.8
Theta hat (MLE)	6.154	Theta star (bias corrected MLE)	7.571
nu hat (MLE)	3181	nu star (bias corrected)	2586
MLE Mean (bias corrected)	611.8	MLE Sd (bias corrected)	68.05
		Approximate Chi Square Value (0.05)	2469
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2456

Assuming Gamma Distribution

95% Approximate Gamma UCL	640.8	95% Adjusted Gamma UCL	644.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.87
10% Shapiro Wilk Critical Value	0.906
Lilliefors Test Statistic	0.222
10% Lilliefors Critical Value	0.196

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.284	Mean of logged Data	6.411
Maximum of Logged Data	6.69	SD of logged Data	0.101

Assuming Lognormal Distribution

95% H-UCL	640.4	90% Chebyshev (MVUE) UCL	658.2
95% Chebyshev (MVUE) UCL	679.2	97.5% Chebyshev (MVUE) UCL	708.5
99% Chebyshev (MVUE) UCL	766		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	639.1	95% BCA Bootstrap UCL	644.2
95% Standard Bootstrap UCL	638	95% Bootstrap-t UCL	658
95% Hall's Bootstrap UCL	769.2	95% Percentile Bootstrap UCL	639.9
90% Chebyshev(Mean, Sd) UCL	661.6	95% Chebyshev(Mean, Sd) UCL	684.2
97.5% Chebyshev(Mean, Sd) UCL	715.6	99% Chebyshev(Mean, Sd) UCL	777.2

Suggested UCL to Use

95% Student's-t UCL	640.9

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (beryllium [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	15
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 report_result_value (beryllium [ug/l]_intrawell_apw-02) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (beryllium [ug/l]_intrawell_apw-03) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (beryllium [ug/l]_intrawell_apw-05/05r) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	15
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!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable report_result_value (beryllium [ug/l]_intrawell_apw-06d) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (beryllium [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (beryllium [ug/l]_intrawell_apw-07) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (beryllium [ug/l]_intrawell_apw-08) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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 report_result_value (beryllium [ug/l]_intrawell_apw-10d) was not processed!

report_result_value (beryllium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (beryllium [ug/l]_intrawell_apw-10s) was not processed!

report_result_value (boron [mg/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	7.75	Mean	8.661
Maximum	9.62	Median	8.73
SD	0.544	Std. Error of Mean	0.141
Coefficient of Variation	0.0628	Skewness	0.137

Normal GOF Test

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8.908	95% Adjusted-CLT UCL (Chen-1995)	8.897
		95% Modified-t UCL (Johnson-1978)	8.909

Gamma GOF Test

A-D Test Statistic	0.492	**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	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	271.8	k star (bias corrected MLE)	217.5
Theta hat (MLE)	0.0319	Theta star (bias corrected MLE)	0.0398

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

nu hat (MLE)	8154	nu star (bias corrected)	6525
MLE Mean (bias corrected)	8.661	MLE Sd (bias corrected)	0.587
		Approximate Chi Square Value (0.05)	6338
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	6315

Assuming Gamma Distribution

95% Approximate Gamma UCL	8.916	95% Adjusted Gamma UCL	8.948

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.177	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.048	Mean of logged Data	2.157
Maximum of Logged Data	2.264	SD of logged Data	0.0628

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	9.082
95% Chebyshev (MVUE) UCL	9.273	97.5% Chebyshev (MVUE) UCL	9.538
99% Chebyshev (MVUE) UCL	10.06		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	8.892	95% BCA Bootstrap UCL	8.911
95% Standard Bootstrap UCL	8.885	95% Bootstrap-t UCL	8.907
95% Hall's Bootstrap UCL	8.882	95% Percentile Bootstrap UCL	8.889
90% Chebyshev(Mean, Sd) UCL	9.082	95% Chebyshev(Mean, Sd) UCL	9.273
97.5% Chebyshev(Mean, Sd) UCL	9.538	99% Chebyshev(Mean, Sd) UCL	10.06

Suggested UCL to Use

95% Student's-t UCL	8.908

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (boron [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	1.84	Mean	4.095
Maximum	4.94	Median	4.27
SD	0.912	Std. Error of Mean	0.235
Coefficient of Variation	0.223	Skewness	-1.771

Normal GOF Test

Shapiro Wilk Test Statistic	0.766	**Shapiro Wilk GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.294	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	4.509	95% Adjusted-CLT UCL (Chen-1995)	4.367
		95% Modified-t UCL (Johnson-1978)	4.491

Gamma GOF Test

A-D Test Statistic	1.837	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.328	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	15.57	k star (bias corrected MLE)	12.5
Theta hat (MLE)	0.263	Theta star (bias corrected MLE)	0.327
nu hat (MLE)	467.2	nu star (bias corrected)	375.1
MLE Mean (bias corrected)	4.095	MLE Sd (bias corrected)	1.158
		Approximate Chi Square Value (0.05)	331.2
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	326.1

Assuming Gamma Distribution

95% Approximate Gamma UCL	4.637	95% Adjusted Gamma UCL	4.709

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.682	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.34	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.61	Mean of logged Data	1.377
Maximum of Logged Data	1.597	SD of logged Data	0.288

Assuming Lognormal Distribution

95% H-UCL	4.771	90% Chebyshev (MVUE) UCL	5.047
95% Chebyshev (MVUE) UCL	5.467	97.5% Chebyshev (MVUE) UCL	6.05
99% Chebyshev (MVUE) UCL	7.196		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	4.482	95% BCA Bootstrap UCL	4.379
95% Standard Bootstrap UCL	4.468	95% Bootstrap-t UCL	4.425
95% Hall's Bootstrap UCL	4.391	95% Percentile Bootstrap UCL	4.444
90% Chebyshev(Mean, Sd) UCL	4.801	95% Chebyshev(Mean, Sd) UCL	5.121
97.5% Chebyshev(Mean, Sd) UCL	5.565	99% Chebyshev(Mean, Sd) UCL	6.437

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Suggested UCL to Use

95% Student's-t UCL 4.509

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (boron [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	7.12	Mean	8.743
Maximum	10.3	Median	8.89
SD	1.032	Std. Error of Mean	0.266
Coefficient of Variation	0.118	Skewness	-0.239

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.163	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	9.212	95% Adjusted-CLT UCL (Chen-1995)	9.163
		95% Modified-t UCL (Johnson-1978)	9.209

Gamma GOF Test

A-D Test Statistic	0.509	**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	0.177	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	74.96	k star (bias corrected MLE)	60.01
Theta hat (MLE)	0.117	Theta star (bias corrected MLE)	0.146
nu hat (MLE)	2249	nu star (bias corrected)	1800
MLE Mean (bias corrected)	8.743	MLE Sd (bias corrected)	1.129
		Approximate Chi Square Value (0.05)	1703
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1691

Assuming Gamma Distribution

95% Approximate Gamma UCL	9.244	95% Adjusted Gamma UCL	9.307

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lilliefors Test Statistic	0.184	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.963	Mean of logged Data	2.162
Maximum of Logged Data	2.332	SD of logged Data	0.121

Assuming Lognormal Distribution

95% H-UCL	9.258	90% Chebyshev (MVUE) UCL	9.561
95% Chebyshev (MVUE) UCL	9.932	97.5% Chebyshev (MVUE) UCL	10.45
99% Chebyshev (MVUE) UCL	11.46		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	9.181	95% BCA Bootstrap UCL	9.179
95% Standard Bootstrap UCL	9.172	95% Bootstrap-t UCL	9.207
95% Hall's Bootstrap UCL	9.155	95% Percentile Bootstrap UCL	9.172
90% Chebyshev(Mean, Sd) UCL	9.542	95% Chebyshev(Mean, Sd) UCL	9.904
97.5% Chebyshev(Mean, Sd) UCL	10.41	99% Chebyshev(Mean, Sd) UCL	11.39

Suggested UCL to Use

95% Student's-t UCL	9.212

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (boron [mg/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	14	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	3.09	Mean	3.943
Maximum	5.51	Median	3.825
SD	0.633	Std. Error of Mean	0.169
Coefficient of Variation	0.16	Skewness	1.426

Normal GOF Test

Shapiro Wilk Test Statistic	0.854	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.825	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.263	Data Not Normal at 1% Significance Level	

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	4.242	95% Adjusted-CLT UCL (Chen-1995)	4.29

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Modified-t UCL (Johnson-1978)	4.253

Gamma GOF Test

A-D Test Statistic	0.772	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.261	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.228	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	46.15	k star (bias corrected MLE)	36.31
Theta hat (MLE)	0.0854	Theta star (bias corrected MLE)	0.109
nu hat (MLE)	1292	nu star (bias corrected)	1017
MLE Mean (bias corrected)	3.943	MLE Sd (bias corrected)	0.654
		Approximate Chi Square Value (0.05)	943.7
Adjusted Level of Significance	0.0312	Adjusted Chi Square Value	934.4

Assuming Gamma Distribution

95% Approximate Gamma UCL	4.248	95% Adjusted Gamma UCL	4.29

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.895	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.208	Data Not Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.128	Mean of logged Data	1.361
Maximum of Logged Data	1.707	SD of logged Data	0.15

Assuming Lognormal Distribution

95% H-UCL	4.248	90% Chebyshev (MVUE) UCL	4.415
95% Chebyshev (MVUE) UCL	4.63	97.5% Chebyshev (MVUE) UCL	4.929
99% Chebyshev (MVUE) UCL	5.514		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	4.221	95% BCA Bootstrap UCL	4.3
95% Standard Bootstrap UCL	4.212	95% Bootstrap-t UCL	4.432
95% Hall's Bootstrap UCL	6.091	95% Percentile Bootstrap UCL	4.229
90% Chebyshev(Mean, Sd) UCL	4.45	95% Chebyshev(Mean, Sd) UCL	4.68
97.5% Chebyshev(Mean, Sd) UCL	4.999	99% Chebyshev(Mean, Sd) UCL	5.626

Suggested UCL to Use

95% Student's-t UCL	4.242

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (boron [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	4.65	Mean	6.281
Maximum	9.19	Median	5.93
SD	1.105	Std. Error of Mean	0.285
Coefficient of Variation	0.176	Skewness	1.109

Normal GOF Test

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6.783	95% Adjusted-CLT UCL (Chen-1995)	6.837
		95% Modified-t UCL (Johnson-1978)	6.797

Gamma GOF Test

A-D Test Statistic	0.43	**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	0.148	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	37.02	k star (bias corrected MLE)	29.66
Theta hat (MLE)	0.17	Theta star (bias corrected MLE)	0.212
nu hat (MLE)	1111	nu star (bias corrected)	889.8
MLE Mean (bias corrected)	6.281	MLE Sd (bias corrected)	1.153
		Approximate Chi Square Value (0.05)	821.6
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	813.5

Assuming Gamma Distribution

95% Approximate Gamma UCL	6.802	95% Adjusted Gamma UCL	6.87

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.155	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.537	Mean of logged Data	1.824
Maximum of Logged Data	2.218	SD of logged Data	0.169

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Lognormal Distribution

95% H-UCL	6.812	90% Chebyshev (MVUE) UCL	7.101
95% Chebyshev (MVUE) UCL	7.474	97.5% Chebyshev (MVUE) UCL	7.991
99% Chebyshev (MVUE) UCL	9.007		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	6.75	95% BCA Bootstrap UCL	6.833
95% Standard Bootstrap UCL	6.728	95% Bootstrap-t UCL	6.897
95% Hall's Bootstrap UCL	7.139	95% Percentile Bootstrap UCL	6.732
90% Chebyshev(Mean, Sd) UCL	7.137	95% Chebyshev(Mean, Sd) UCL	7.524
97.5% Chebyshev(Mean, Sd) UCL	8.062	99% Chebyshev(Mean, Sd) UCL	9.119

Suggested UCL to Use

95% Student's-t UCL	6.783

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (boron [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	0.168	Mean	0.261
Maximum	0.342	Median	0.274
SD	0.0523	Std. Error of Mean	0.0135
Coefficient of Variation	0.201	Skewness	-0.32

Normal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.161	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.285	95% Adjusted-CLT UCL (Chen-1995)	0.282
		95% Modified-t UCL (Johnson-1978)	0.284

Gamma GOF Test

A-D Test Statistic	0.385	**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	0.172	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	24.8	k star (bias corrected MLE)	19.89

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Theta hat (MLE)	0.0105	Theta star (bias corrected MLE)	0.0131
nu hat (MLE)	744.1	nu star (bias corrected)	596.6
MLE Mean (bias corrected)	0.261	MLE Sd (bias corrected)	0.0585
		Approximate Chi Square Value (0.05)	540.9
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	534.4

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.288	95% Adjusted Gamma UCL	0.291

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.165	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.784	Mean of logged Data	-1.364
Maximum of Logged Data	-1.073	SD of logged Data	0.213

Assuming Lognormal Distribution

95% H-UCL	0.29	90% Chebyshev (MVUE) UCL	0.304
95% Chebyshev (MVUE) UCL	0.324	97.5% Chebyshev (MVUE) UCL	0.351
99% Chebyshev (MVUE) UCL	0.405		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	0.283	95% BCA Bootstrap UCL	0.282
95% Standard Bootstrap UCL	0.282	95% Bootstrap-t UCL	0.284
95% Hall's Bootstrap UCL	0.282	95% Percentile Bootstrap UCL	0.282
90% Chebyshev(Mean, Sd) UCL	0.301	95% Chebyshev(Mean, Sd) UCL	0.32
97.5% Chebyshev(Mean, Sd) UCL	0.345	99% Chebyshev(Mean, Sd) UCL	0.395

Suggested UCL to Use

95% Student's-t UCL	0.285

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (boron [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	0.095	Mean	0.128
Maximum	0.155	Median	0.132
SD	0.0199	Std. Error of Mean	0.00514

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Coefficient of Variation	0.155	Skewness	-0.256

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.173	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.137	95% Adjusted-CLT UCL (Chen-1995)	0.136
		95% Modified-t UCL (Johnson-1978)	0.137

Gamma GOF Test

A-D Test Statistic	0.466	**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	0.193	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	42.82	k star (bias corrected MLE)	34.3
Theta hat (MLE)	0.003	Theta star (bias corrected MLE)	0.00374
nu hat (MLE)	1285	nu star (bias corrected)	1029
MLE Mean (bias corrected)	0.128	MLE Sd (bias corrected)	0.0219
		Approximate Chi Square Value (0.05)	955.5
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	946.8

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.138	95% Adjusted Gamma UCL	0.139

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.198	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.354	Mean of logged Data	-2.065
Maximum of Logged Data	-1.864	SD of logged Data	0.16

Assuming Lognormal Distribution

95% H-UCL	0.139	90% Chebyshev (MVUE) UCL	0.144
95% Chebyshev (MVUE) UCL	0.152	97.5% Chebyshev (MVUE) UCL	0.162
99% Chebyshev (MVUE) UCL	0.181		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	0.137	95% BCA Bootstrap UCL	0.136
95% Standard Bootstrap UCL	0.137	95% Bootstrap-t UCL	0.138

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Hall's Bootstrap UCL	0.136	95% Percentile Bootstrap UCL	0.136
90% Chebyshev(Mean, Sd) UCL	0.144	95% Chebyshev(Mean, Sd) UCL	0.151
97.5% Chebyshev(Mean, Sd) UCL	0.16	99% Chebyshev(Mean, Sd) UCL	0.179

Suggested UCL to Use

95% Student's-t UCL 0.137

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (boron [mg/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	0.0522	Mean	0.083
Maximum	0.118	Median	0.0843
SD	0.0168	Std. Error of Mean	0.00435
Coefficient of Variation	0.203	Skewness	0.235

Normal GOF Test

Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0907	95% Adjusted-CLT UCL (Chen-1995)	0.0904
		95% Modified-t UCL (Johnson-1978)	0.0907

Gamma GOF Test

A-D Test Statistic	0.248	**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	0.127	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	25.6	k star (bias corrected MLE)	20.53
Theta hat (MLE)	0.00324	Theta star (bias corrected MLE)	0.00404
nu hat (MLE)	768.1	nu star (bias corrected)	615.8
MLE Mean (bias corrected)	0.083	MLE Sd (bias corrected)	0.0183
		Approximate Chi Square Value (0.05)	559.3
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	552.6

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0914	95% Adjusted Gamma UCL	0.0925

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.953	Mean of logged Data	-2.508
Maximum of Logged Data	-2.137	SD of logged Data	0.207

Assuming Lognormal Distribution

95% H-UCL	0.092	90% Chebyshev (MVUE) UCL	0.0964
95% Chebyshev (MVUE) UCL	0.103	97.5% Chebyshev (MVUE) UCL	0.111
99% Chebyshev (MVUE) UCL	0.127		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0902	95% BCA Bootstrap UCL	0.0905
95% Standard Bootstrap UCL	0.09	95% Bootstrap-t UCL	0.0911
95% Hall's Bootstrap UCL	0.0911	95% Percentile Bootstrap UCL	0.0901
90% Chebyshev(Mean, Sd) UCL	0.0961	95% Chebyshev(Mean, Sd) UCL	0.102
97.5% Chebyshev(Mean, Sd) UCL	0.11	99% Chebyshev(Mean, Sd) UCL	0.126

Suggested UCL to Use

95% Student's-t UCL	0.0907

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (boron [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	0.525	Mean	0.576
Maximum	0.683	Median	0.569
SD	0.0416	Std. Error of Mean	0.0107
Coefficient of Variation	0.0722	Skewness	1.446

Normal GOF Test

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL **95% UCLs (Adjusted for Skewness)**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Student's-t UCL	0.595	95% Adjusted-CLT UCL (Chen-1995)	0.598
		95% Modified-t UCL (Johnson-1978)	0.596

Gamma GOF Test

A-D Test Statistic	0.607	**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	0.177	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	216.8	k star (bias corrected MLE)	173.5
Theta hat (MLE)	0.00266	Theta star (bias corrected MLE)	0.00332
nu hat (MLE)	6504	nu star (bias corrected)	5205
MLE Mean (bias corrected)	0.576	MLE Sd (bias corrected)	0.0437
		Approximate Chi Square Value (0.05)	5038
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	5018

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.595	95% Adjusted Gamma UCL	0.598

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.644	Mean of logged Data	-0.553
Maximum of Logged Data	-0.381	SD of logged Data	0.0694

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	0.607
95% Chebyshev (MVUE) UCL	0.621	97.5% Chebyshev (MVUE) UCL	0.641
99% Chebyshev (MVUE) UCL	0.679		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	0.594	95% BCA Bootstrap UCL	0.598
95% Standard Bootstrap UCL	0.594	95% Bootstrap-t UCL	0.604
95% Hall's Bootstrap UCL	0.643	95% Percentile Bootstrap UCL	0.594
90% Chebyshev(Mean, Sd) UCL	0.608	95% Chebyshev(Mean, Sd) UCL	0.623
97.5% Chebyshev(Mean, Sd) UCL	0.643	99% Chebyshev(Mean, Sd) UCL	0.683

Suggested UCL to Use

95% Student's-t UCL	0.595

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (cadmium [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-02) was not processed!

report_result_value (cadmium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-03) was not processed!

report_result_value (cadmium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-05/05r) was not processed!

report_result_value (cadmium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	15
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-06d) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (cadmium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (cadmium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-07) was not processed!

report_result_value (cadmium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-08) was not processed!

report_result_value (cadmium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-10d) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (cadmium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (cadmium [ug/l]_intrawell_apw-10s) was not processed!

report_result_value (calcium [mg/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	132	Mean	154.9
Maximum	198	Median	148
SD	20.67	Std. Error of Mean	5.336
Coefficient of Variation	0.133	Skewness	0.813

Normal GOF Test

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	164.3	95% Adjusted-CLT UCL (Chen-1995)	164.9
		95% Modified-t UCL (Johnson-1978)	164.5

Gamma GOF Test

A-D Test Statistic	0.431	**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	0.158	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	63.19	k star (bias corrected MLE)	50.6
Theta hat (MLE)	2.452	Theta star (bias corrected MLE)	3.062
nu hat (MLE)	1896	nu star (bias corrected)	1518
MLE Mean (bias corrected)	154.9	MLE Sd (bias corrected)	21.78
		Approximate Chi Square Value (0.05)	1428
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1418

Assuming Gamma Distribution

95% Approximate Gamma UCL	164.6	95% Adjusted Gamma UCL	165.9

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.149	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.883	Mean of logged Data	5.035
Maximum of Logged Data	5.288	SD of logged Data	0.129

Assuming Lognormal Distribution

95% H-UCL	164.7	90% Chebyshev (MVUE) UCL	170.4
95% Chebyshev (MVUE) UCL	177.4	97.5% Chebyshev (MVUE) UCL	187.2
99% Chebyshev (MVUE) UCL	206.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	163.7	95% BCA Bootstrap UCL	164.5
95% Standard Bootstrap UCL	163.5	95% Bootstrap-t UCL	166.2
95% Hall's Bootstrap UCL	165.6	95% Percentile Bootstrap UCL	163.8
90% Chebyshev(Mean, Sd) UCL	170.9	95% Chebyshev(Mean, Sd) UCL	178.2
97.5% Chebyshev(Mean, Sd) UCL	188.3	99% Chebyshev(Mean, Sd) UCL	208

Suggested UCL to Use

95% Student's-t UCL	164.3

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (calcium [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	74.9	Mean	109.5
Maximum	153	Median	111
SD	23.54	Std. Error of Mean	6.077
Coefficient of Variation	0.215	Skewness	0.302

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL **95% UCLs (Adjusted for Skewness)**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Student's-t UCL	120.2	95% Adjusted-CLT UCL (Chen-1995)	120
		95% Modified-t UCL (Johnson-1978)	120.3

Gamma GOF Test

A-D Test Statistic	0.197	**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	0.0969	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	23.17	k star (bias corrected MLE)	18.58
Theta hat (MLE)	4.725	Theta star (bias corrected MLE)	5.892
nu hat (MLE)	695.2	nu star (bias corrected)	557.5
MLE Mean (bias corrected)	109.5	MLE Sd (bias corrected)	25.4
		Approximate Chi Square Value (0.05)	503.7
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	497.4

Assuming Gamma Distribution

95% Approximate Gamma UCL	121.2	95% Adjusted Gamma UCL	122.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0982	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.316	Mean of logged Data	4.674
Maximum of Logged Data	5.03	SD of logged Data	0.217

Assuming Lognormal Distribution

95% H-UCL	121.9	90% Chebyshev (MVUE) UCL	128
95% Chebyshev (MVUE) UCL	136.4	97.5% Chebyshev (MVUE) UCL	148
99% Chebyshev (MVUE) UCL	170.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	119.5	95% BCA Bootstrap UCL	119.6
95% Standard Bootstrap UCL	119.2	95% Bootstrap-t UCL	120.6
95% Hall's Bootstrap UCL	120	95% Percentile Bootstrap UCL	119.6
90% Chebyshev(Mean, Sd) UCL	127.7	95% Chebyshev(Mean, Sd) UCL	136
97.5% Chebyshev(Mean, Sd) UCL	147.4	99% Chebyshev(Mean, Sd) UCL	170

Suggested UCL to Use

95% Student's-t UCL	120.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (calcium [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	97.1	Mean	122.8
Maximum	142	Median	124
SD	11.87	Std. Error of Mean	3.064
Coefficient of Variation	0.0966	Skewness	-0.581

Normal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.112	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	128.2	95% Adjusted-CLT UCL (Chen-1995)	127.4
		95% Modified-t UCL (Johnson-1978)	128.1

Gamma GOF Test

A-D Test Statistic	0.299	**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	0.119	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	109.8	k star (bias corrected MLE)	87.91
Theta hat (MLE)	1.118	Theta star (bias corrected MLE)	1.397
nu hat (MLE)	3295	nu star (bias corrected)	2637
MLE Mean (bias corrected)	122.8	MLE Sd (bias corrected)	13.1
		Approximate Chi Square Value (0.05)	2519
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	2505

Assuming Gamma Distribution

95% Approximate Gamma UCL	128.6	95% Adjusted Gamma UCL	129.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.131	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.576	Mean of logged Data	4.806
Maximum of Logged Data	4.956	SD of logged Data	0.1

Assuming Lognormal Distribution

95% H-UCL	128.7	90% Chebyshev (MVUE) UCL	132.4

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Chebyshev (MVUE) UCL	136.7	97.5% Chebyshev (MVUE) UCL	142.7
99% Chebyshev (MVUE) UCL	154.4		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	127.8	95% BCA Bootstrap UCL	127.2
95% Standard Bootstrap UCL	127.6	95% Bootstrap-t UCL	127.7
95% Hall's Bootstrap UCL	127.6	95% Percentile Bootstrap UCL	127.6
90% Chebyshev(Mean, Sd) UCL	132	95% Chebyshev(Mean, Sd) UCL	136.2
97.5% Chebyshev(Mean, Sd) UCL	141.9	99% Chebyshev(Mean, Sd) UCL	153.3

Suggested UCL to Use

95% Student's-t UCL	128.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (calcium [mg/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	14	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	96.7	Mean	108.2
Maximum	128	Median	106.5
SD	9.084	Std. Error of Mean	2.428
Coefficient of Variation	0.0839	Skewness	0.932

Normal GOF Test

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.825	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.263	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	112.5	95% Adjusted-CLT UCL (Chen-1995)	112.9
		95% Modified-t UCL (Johnson-1978)	112.6

Gamma GOF Test

A-D Test Statistic	0.423	**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	0.194	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.228	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

k hat (MLE)	158.7	k star (bias corrected MLE)	124.7
Theta hat (MLE)	0.682	Theta star (bias corrected MLE)	0.868
nu hat (MLE)	4443	nu star (bias corrected)	3492
MLE Mean (bias corrected)	108.2	MLE Sd (bias corrected)	9.689
		Approximate Chi Square Value (0.05)	3356
Adjusted Level of Significance	0.0312	Adjusted Chi Square Value	3338

Assuming Gamma Distribution

95% Approximate Gamma UCL	112.6	95% Adjusted Gamma UCL	113.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.895	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.191	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.208	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.572	Mean of logged Data	4.681
Maximum of Logged Data	4.852	SD of logged Data	0.0817

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	115.3
95% Chebyshev (MVUE) UCL	118.5	97.5% Chebyshev (MVUE) UCL	123
99% Chebyshev (MVUE) UCL	131.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	112.2	95% BCA Bootstrap UCL	112.6
95% Standard Bootstrap UCL	112.1	95% Bootstrap-t UCL	113.7
95% Hall's Bootstrap UCL	115	95% Percentile Bootstrap UCL	112.2
90% Chebyshev(Mean, Sd) UCL	115.5	95% Chebyshev(Mean, Sd) UCL	118.8
97.5% Chebyshev(Mean, Sd) UCL	123.4	99% Chebyshev(Mean, Sd) UCL	132.4

Suggested UCL to Use

95% Student's-t UCL	112.5

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (calcium [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	87.5	Mean	99.2
Maximum	115	Median	98.1
SD	6.968	Std. Error of Mean	1.799
Coefficient of Variation	0.0702	Skewness	0.596

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Normal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	102.4	95% Adjusted-CLT UCL (Chen-1995)	102.5
		95% Modified-t UCL (Johnson-1978)	102.4

Gamma GOF Test

A-D Test Statistic	0.354	**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	0.167	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	221.1	k star (bias corrected MLE)	176.9
Theta hat (MLE)	0.449	Theta star (bias corrected MLE)	0.561
nu hat (MLE)	6633	nu star (bias corrected)	5308
MLE Mean (bias corrected)	99.2	MLE Sd (bias corrected)	7.458
		Approximate Chi Square Value (0.05)	5139
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	5119

Assuming Gamma Distribution

95% Approximate Gamma UCL	102.4	95% Adjusted Gamma UCL	102.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.472	Mean of logged Data	4.595
Maximum of Logged Data	4.745	SD of logged Data	0.0694

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	104.5
95% Chebyshev (MVUE) UCL	106.9	97.5% Chebyshev (MVUE) UCL	110.3
99% Chebyshev (MVUE) UCL	116.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	102.2	95% BCA Bootstrap UCL	102.3
95% Standard Bootstrap UCL	102.1	95% Bootstrap-t UCL	102.8
95% Hall's Bootstrap UCL	103.3	95% Percentile Bootstrap UCL	102.2
90% Chebyshev(Mean, Sd) UCL	104.6	95% Chebyshev(Mean, Sd) UCL	107

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

97.5% Chebyshev(Mean, Sd) UCL	110.4	99% Chebyshev(Mean, Sd) UCL	117.1

Suggested UCL to Use

95% Student's-t UCL 102.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (calcium [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	161	Mean	193.1
Maximum	238	Median	192
SD	18.36	Std. Error of Mean	4.74
Coefficient of Variation	0.095	Skewness	0.675

Normal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.112	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	201.5	95% Adjusted-CLT UCL (Chen-1995)	201.8
		95% Modified-t UCL (Johnson-1978)	201.6

Gamma GOF Test

A-D Test Statistic	0.204	**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	0.1	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	121.5	k star (bias corrected MLE)	97.23
Theta hat (MLE)	1.59	Theta star (bias corrected MLE)	1.986
nu hat (MLE)	3645	nu star (bias corrected)	2917
MLE Mean (bias corrected)	193.1	MLE Sd (bias corrected)	19.59
		Approximate Chi Square Value (0.05)	2793
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	2778

Assuming Gamma Distribution

95% Approximate Gamma UCL	201.7	95% Adjusted Gamma UCL	202.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.107	**Lilliefors Lognormal GOF Test**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.081	Mean of logged Data	5.259
Maximum of Logged Data	5.472	SD of logged Data	0.0936

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	207.1
95% Chebyshev (MVUE) UCL	213.5	97.5% Chebyshev (MVUE) UCL	222.3
99% Chebyshev (MVUE) UCL	239.6		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	200.9	95% BCA Bootstrap UCL	201.5
95% Standard Bootstrap UCL	200.7	95% Bootstrap-t UCL	202.5
95% Hall's Bootstrap UCL	204.6	95% Percentile Bootstrap UCL	201.3
90% Chebyshev(Mean, Sd) UCL	207.4	95% Chebyshev(Mean, Sd) UCL	213.8
97.5% Chebyshev(Mean, Sd) UCL	222.7	99% Chebyshev(Mean, Sd) UCL	240.3

Suggested UCL to Use

95% Student's-t UCL	201.5

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (calcium [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	79.4	Mean	93.13
Maximum	105	Median	95
SD	8.202	Std. Error of Mean	2.118
Coefficient of Variation	0.0881	Skewness	-0.413

Normal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	96.86	95% Adjusted-CLT UCL (Chen-1995)	96.38
		95% Modified-t UCL (Johnson-1978)	96.83

Gamma GOF Test

A-D Test Statistic	0.538	**Anderson-Darling Gamma GOF Test**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.176	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	134.5	k star (bias corrected MLE)	107.7
Theta hat (MLE)	0.692	Theta star (bias corrected MLE)	0.865
nu hat (MLE)	4036	nu star (bias corrected)	3230
MLE Mean (bias corrected)	93.13	MLE Sd (bias corrected)	8.975
		Approximate Chi Square Value (0.05)	3099
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	3084

Assuming Gamma Distribution

95% Approximate Gamma UCL	97.07	95% Adjusted Gamma UCL	97.57

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.374	Mean of logged Data	4.53
Maximum of Logged Data	4.654	SD of logged Data	0.0899

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	99.63
95% Chebyshev (MVUE) UCL	102.6	97.5% Chebyshev (MVUE) UCL	106.7
99% Chebyshev (MVUE) UCL	114.7		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	96.62	95% BCA Bootstrap UCL	96.41
95% Standard Bootstrap UCL	96.46	95% Bootstrap-t UCL	96.51
95% Hall's Bootstrap UCL	96.18	95% Percentile Bootstrap UCL	96.41
90% Chebyshev(Mean, Sd) UCL	99.49	95% Chebyshev(Mean, Sd) UCL	102.4
97.5% Chebyshev(Mean, Sd) UCL	106.4	99% Chebyshev(Mean, Sd) UCL	114.2

Suggested UCL to Use

95% Student's-t UCL	96.86

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (calcium [mg/l]_intrawell_apw-10d)

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	115	Mean	174
Maximum	611	Median	123
SD	137.1	Std. Error of Mean	35.4
Coefficient of Variation	0.788	Skewness	2.871

Normal GOF Test

Shapiro Wilk Test Statistic	0.474	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.442	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	236.4	95% Adjusted-CLT UCL (Chen-1995)	260.3
		95% Modified-t UCL (Johnson-1978)	240.7

Gamma GOF Test

A-D Test Statistic	3.436	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.409	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.223	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.405	k star (bias corrected MLE)	2.769
Theta hat (MLE)	51.1	Theta star (bias corrected MLE)	62.85
nu hat (MLE)	102.2	nu star (bias corrected)	83.06
MLE Mean (bias corrected)	174	MLE Sd (bias corrected)	104.6
		Approximate Chi Square Value (0.05)	63.05
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	60.91

Assuming Gamma Distribution

95% Approximate Gamma UCL	229.2	95% Adjusted Gamma UCL	237.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.543	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.375	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.745	Mean of logged Data	5.005
Maximum of Logged Data	6.415	SD of logged Data	0.486

Assuming Lognormal Distribution

95% H-UCL	219.2	90% Chebyshev (MVUE) UCL	230.9
95% Chebyshev (MVUE) UCL	260.1	97.5% Chebyshev (MVUE) UCL	300.7
99% Chebyshev (MVUE) UCL	380.3		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	232.2	95% BCA Bootstrap UCL	273
95% Standard Bootstrap UCL	230.8	95% Bootstrap-t UCL	1002
95% Hall's Bootstrap UCL	683.4	95% Percentile Bootstrap UCL	238.4
90% Chebyshev(Mean, Sd) UCL	280.2	95% Chebyshev(Mean, Sd) UCL	328.3
97.5% Chebyshev(Mean, Sd) UCL	395.1	99% Chebyshev(Mean, Sd) UCL	526.3

Suggested UCL to Use

95% Student's-t UCL	236.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (calcium [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	129	Mean	145.9
Maximum	171	Median	145
SD	11.17	Std. Error of Mean	2.884
Coefficient of Variation	0.0765	Skewness	0.655

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	151	95% Adjusted-CLT UCL (Chen-1995)	151.2
		95% Modified-t UCL (Johnson-1978)	151.1

Gamma GOF Test

A-D Test Statistic	0.208	**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	0.125	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	187.1	k star (bias corrected MLE)	149.7
Theta hat (MLE)	0.78	Theta star (bias corrected MLE)	0.975
nu hat (MLE)	5612	nu star (bias corrected)	4491
MLE Mean (bias corrected)	145.9	MLE Sd (bias corrected)	11.93
		Approximate Chi Square Value (0.05)	4336

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	4318

Assuming Gamma Distribution

95% Approximate Gamma UCL	151.1	95% Adjusted Gamma UCL	151.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.12	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.86	Mean of logged Data	4.98
Maximum of Logged Data	5.142	SD of logged Data	0.0753

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	154.5
95% Chebyshev (MVUE) UCL	158.3	97.5% Chebyshev (MVUE) UCL	163.7
99% Chebyshev (MVUE) UCL	174.2		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	150.7	95% BCA Bootstrap UCL	150.9
95% Standard Bootstrap UCL	150.6	95% Bootstrap-t UCL	151.3
95% Hall's Bootstrap UCL	151.6	95% Percentile Bootstrap UCL	150.8
90% Chebyshev(Mean, Sd) UCL	154.6	95% Chebyshev(Mean, Sd) UCL	158.5
97.5% Chebyshev(Mean, Sd) UCL	163.9	99% Chebyshev(Mean, Sd) UCL	174.6

Suggested UCL to Use

95% Student's-t UCL	151

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chloride [mg/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	7	Mean	10.24
Maximum	13	Median	11
SD	2.001	Std. Error of Mean	0.5
Coefficient of Variation	0.195	Skewness	-0.454

Normal GOF Test

Shapiro Wilk Test Statistic	0.891	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.211	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	11.11	95% Adjusted-CLT UCL (Chen-1995)	11
		95% Modified-t UCL (Johnson-1978)	11.1

Gamma GOF Test

A-D Test Statistic	0.842	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.231	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	25.81	k star (bias corrected MLE)	21.01
Theta hat (MLE)	0.397	Theta star (bias corrected MLE)	0.487
nu hat (MLE)	826	nu star (bias corrected)	672.4
MLE Mean (bias corrected)	10.24	MLE Sd (bias corrected)	2.233
		Approximate Chi Square Value (0.05)	613.3
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	606.8

Assuming Gamma Distribution

95% Approximate Gamma UCL	11.22	95% Adjusted Gamma UCL	11.34

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.946	Mean of logged Data	2.306
Maximum of Logged Data	2.565	SD of logged Data	0.208

Assuming Lognormal Distribution

95% H-UCL	11.31	90% Chebyshev (MVUE) UCL	11.86
95% Chebyshev (MVUE) UCL	12.59	97.5% Chebyshev (MVUE) UCL	13.6
99% Chebyshev (MVUE) UCL	15.59		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	11.06	95% BCA Bootstrap UCL	10.94
95% Standard Bootstrap UCL	11.02	95% Bootstrap-t UCL	11.08
95% Hall's Bootstrap UCL	10.99	95% Percentile Bootstrap UCL	11
90% Chebyshev(Mean, Sd) UCL	11.74	95% Chebyshev(Mean, Sd) UCL	12.42
97.5% Chebyshev(Mean, Sd) UCL	13.36	99% Chebyshev(Mean, Sd) UCL	15.21

Suggested UCL to Use

95% Student's-t UCL	11.11

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (chloride [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	8.04	Mean	18.32
Maximum	23	Median	20
SD	4.136	Std. Error of Mean	1.034
Coefficient of Variation	0.226	Skewness	-1.335

Normal GOF Test

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.221	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	20.13	95% Adjusted-CLT UCL (Chen-1995)	19.65
		95% Modified-t UCL (Johnson-1978)	20.07

Gamma GOF Test

A-D Test Statistic	1.185	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.738	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.232	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	15.93	k star (bias corrected MLE)	12.99
Theta hat (MLE)	1.15	Theta star (bias corrected MLE)	1.41
nu hat (MLE)	509.8	nu star (bias corrected)	415.5
MLE Mean (bias corrected)	18.32	MLE Sd (bias corrected)	5.083
		Approximate Chi Square Value (0.05)	369.3
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	364.3

Assuming Gamma Distribution

95% Approximate Gamma UCL	20.61	95% Adjusted Gamma UCL	20.89

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.774	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.231	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal Statistics

Minimum of Logged Data	2.084	Mean of logged Data	2.876
Maximum of Logged Data	3.135	SD of logged Data	0.281

Assuming Lognormal Distribution

95% H-UCL	21.11	90% Chebyshev (MVUE) UCL	22.33
95% Chebyshev (MVUE) UCL	24.1	97.5% Chebyshev (MVUE) UCL	26.56
99% Chebyshev (MVUE) UCL	31.4		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	20.02	95% BCA Bootstrap UCL	19.69
95% Standard Bootstrap UCL	19.96	95% Bootstrap-t UCL	19.87
95% Hall's Bootstrap UCL	19.73	95% Percentile Bootstrap UCL	19.88
90% Chebyshev(Mean, Sd) UCL	21.42	95% Chebyshev(Mean, Sd) UCL	22.82
97.5% Chebyshev(Mean, Sd) UCL	24.77	99% Chebyshev(Mean, Sd) UCL	28.6

Suggested UCL to Use

95% Student's-t UCL	20.13

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (chloride [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	14	Mean	16.12
Maximum	19	Median	16
SD	1.54	Std. Error of Mean	0.385
Coefficient of Variation	0.0956	Skewness	0.647

Normal GOF Test

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.218	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16.79	95% Adjusted-CLT UCL (Chen-1995)	16.82
		95% Modified-t UCL (Johnson-1978)	16.8

Gamma GOF Test

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

A-D Test Statistic	0.549	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.208	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	120.1	k star (bias corrected MLE)	97.64
Theta hat (MLE)	0.134	Theta star (bias corrected MLE)	0.165
nu hat (MLE)	3844	nu star (bias corrected)	3124
MLE Mean (bias corrected)	16.12	MLE Sd (bias corrected)	1.631
		Approximate Chi Square Value (0.05)	2995
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2981

Assuming Gamma Distribution

95% Approximate Gamma UCL	16.81	95% Adjusted Gamma UCL	16.89

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.201	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.639	Mean of logged Data	2.776
Maximum of Logged Data	2.944	SD of logged Data	0.0937

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	17.25
95% Chebyshev (MVUE) UCL	17.77	97.5% Chebyshev (MVUE) UCL	18.48
99% Chebyshev (MVUE) UCL	19.88		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	16.75	95% BCA Bootstrap UCL	16.75
95% Standard Bootstrap UCL	16.73	95% Bootstrap-t UCL	16.88
95% Hall's Bootstrap UCL	16.85	95% Percentile Bootstrap UCL	16.75
90% Chebyshev(Mean, Sd) UCL	17.27	95% Chebyshev(Mean, Sd) UCL	17.8
97.5% Chebyshev(Mean, Sd) UCL	18.52	99% Chebyshev(Mean, Sd) UCL	19.95

Suggested UCL to Use

95% Student's-t UCL	16.79

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chloride [mg/l]_intrawell_apw-06d)

General Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Total Number of Observations	15	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	14	Mean	16.88
Maximum	22	Median	16
SD	2.095	Std. Error of Mean	0.541
Coefficient of Variation	0.124	Skewness	1.616

Normal GOF Test

Shapiro Wilk Test Statistic	0.769	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.344	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	17.83	95% Adjusted-CLT UCL (Chen-1995)	18.01
		95% Modified-t UCL (Johnson-1978)	17.87

Gamma GOF Test

A-D Test Statistic	1.461	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.327	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	76.55	k star (bias corrected MLE)	61.28
Theta hat (MLE)	0.221	Theta star (bias corrected MLE)	0.275
nu hat (MLE)	2296	nu star (bias corrected)	1838
MLE Mean (bias corrected)	16.88	MLE Sd (bias corrected)	2.156
		Approximate Chi Square Value (0.05)	1740
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1728

Assuming Gamma Distribution

95% Approximate Gamma UCL	17.84	95% Adjusted Gamma UCL	17.96

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.809	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.639	Mean of logged Data	2.82
Maximum of Logged Data	3.091	SD of logged Data	0.116

Assuming Lognormal Distribution

95% H-UCL	17.83	90% Chebyshev (MVUE) UCL	18.39
95% Chebyshev (MVUE) UCL	19.08	97.5% Chebyshev (MVUE) UCL	20.03
99% Chebyshev (MVUE) UCL	21.91		

Nonparametric Distribution Free UCL Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	17.77	95% BCA Bootstrap UCL	17.91
95% Standard Bootstrap UCL	17.75	95% Bootstrap-t UCL	18.77
95% Hall's Bootstrap UCL	24.38	95% Percentile Bootstrap UCL	17.81
90% Chebyshev(Mean, Sd) UCL	18.5	95% Chebyshev(Mean, Sd) UCL	19.24
97.5% Chebyshev(Mean, Sd) UCL	20.26	99% Chebyshev(Mean, Sd) UCL	22.26

Suggested UCL to Use

95% Student's-t UCL	17.83

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chloride [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	20	Mean	25.01
Maximum	31	Median	25
SD	2.762	Std. Error of Mean	0.691
Coefficient of Variation	0.11	Skewness	0.169

Normal GOF Test

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.111	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	26.22	95% Adjusted-CLT UCL (Chen-1995)	26.18
		95% Modified-t UCL (Johnson-1978)	26.23

Gamma GOF Test

A-D Test Statistic	0.206	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	87.19	k star (bias corrected MLE)	70.88
Theta hat (MLE)	0.287	Theta star (bias corrected MLE)	0.353
nu hat (MLE)	2790	nu star (bias corrected)	2268
MLE Mean (bias corrected)	25.01	MLE Sd (bias corrected)	2.971
		Approximate Chi Square Value (0.05)	2159
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2146

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Gamma Distribution

95% Approximate Gamma UCL	26.28	95% Adjusted Gamma UCL	26.43

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.981	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.124	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.996	Mean of logged Data	3.214
Maximum of Logged Data	3.434	SD of logged Data	0.111

Assuming Lognormal Distribution

95% H-UCL	26.31	90% Chebyshev (MVUE) UCL	27.1
95% Chebyshev (MVUE) UCL	28.04	97.5% Chebyshev (MVUE) UCL	29.35
99% Chebyshev (MVUE) UCL	31.93		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	26.15	95% BCA Bootstrap UCL	26.14
95% Standard Bootstrap UCL	26.12	95% Bootstrap-t UCL	26.23
95% Hall's Bootstrap UCL	26.29	95% Percentile Bootstrap UCL	26.13
90% Chebyshev(Mean, Sd) UCL	27.08	95% Chebyshev(Mean, Sd) UCL	28.02
97.5% Chebyshev(Mean, Sd) UCL	29.32	99% Chebyshev(Mean, Sd) UCL	31.88

Suggested UCL to Use

95% Student's-t UCL	26.22

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chloride [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	9	Mean	13.16
Maximum	16	Median	14
SD	2.189	Std. Error of Mean	0.547
Coefficient of Variation	0.166	Skewness	-0.502

Normal GOF Test

Shapiro Wilk Test Statistic	0.88	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.238	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Normal Distribution

95% Normal UCL

95% Student's-t UCL	14.12

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	13.98
95% Modified-t UCL (Johnson-1978)	14.1

Gamma GOF Test

A-D Test Statistic	0.959
5% A-D Critical Value	0.736
K-S Test Statistic	0.242
5% K-S Critical Value	0.215

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	35.95	k star (bias corrected MLE)	29.25
Theta hat (MLE)	0.366	Theta star (bias corrected MLE)	0.45
nu hat (MLE)	1150	nu star (bias corrected)	935.9
MLE Mean (bias corrected)	13.16	MLE Sd (bias corrected)	2.433
		Approximate Chi Square Value (0.05)	865.9
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	858.3

Assuming Gamma Distribution

95% Approximate Gamma UCL	14.22	95% Adjusted Gamma UCL	14.35

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.873
10% Shapiro Wilk Critical Value	0.906
Lilliefors Test Statistic	0.233
10% Lilliefors Critical Value	0.196

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.197	Mean of logged Data	2.563
Maximum of Logged Data	2.773	SD of logged Data	0.176

Assuming Lognormal Distribution

95% H-UCL	14.29	90% Chebyshev (MVUE) UCL	14.91
95% Chebyshev (MVUE) UCL	15.7	97.5% Chebyshev (MVUE) UCL	16.8
99% Chebyshev (MVUE) UCL	18.95		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	14.06	95% BCA Bootstrap UCL	13.94
95% Standard Bootstrap UCL	14.02	95% Bootstrap-t UCL	14.03
95% Hall's Bootstrap UCL	13.95	95% Percentile Bootstrap UCL	14
90% Chebyshev(Mean, Sd) UCL	14.8	95% Chebyshev(Mean, Sd) UCL	15.54
97.5% Chebyshev(Mean, Sd) UCL	16.57	99% Chebyshev(Mean, Sd) UCL	18.6

Suggested UCL to Use

95% Student's-t UCL	14.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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.

report_result_value (chloride [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	9	Mean	10.6
Maximum	13	Median	10.3
SD	1.083	Std. Error of Mean	0.271
Coefficient of Variation	0.102	Skewness	0.604

Normal GOF Test

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.21	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	11.07	95% Adjusted-CLT UCL (Chen-1995)	11.09
		95% Modified-t UCL (Johnson-1978)	11.08

Gamma GOF Test

A-D Test Statistic	0.597	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	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	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	104.7	k star (bias corrected MLE)	85.14
Theta hat (MLE)	0.101	Theta star (bias corrected MLE)	0.125
nu hat (MLE)	3351	nu star (bias corrected)	2724
MLE Mean (bias corrected)	10.6	MLE Sd (bias corrected)	1.149
		Approximate Chi Square Value (0.05)	2604
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2591

Assuming Gamma Distribution

95% Approximate Gamma UCL	11.09	95% Adjusted Gamma UCL	11.15

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Minimum of Logged Data	2.197	Mean of logged Data	2.356
Maximum of Logged Data	2.565	SD of logged Data	0.1

Assuming Lognormal Distribution

95% H-UCL	11.09	90% Chebyshev (MVUE) UCL	11.4
95% Chebyshev (MVUE) UCL	11.76	97.5% Chebyshev (MVUE) UCL	12.26
99% Chebyshev (MVUE) UCL	13.25		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	11.05	95% BCA Bootstrap UCL	11.06
95% Standard Bootstrap UCL	11.04	95% Bootstrap-t UCL	11.14
95% Hall's Bootstrap UCL	11.14	95% Percentile Bootstrap UCL	11.06
90% Chebyshev(Mean, Sd) UCL	11.41	95% Chebyshev(Mean, Sd) UCL	11.78
97.5% Chebyshev(Mean, Sd) UCL	12.29	99% Chebyshev(Mean, Sd) UCL	13.29

Suggested UCL to Use

95% Student's-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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chloride [mg/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	10	Mean	15.4
Maximum	24	Median	15.7
SD	3.262	Std. Error of Mean	0.815
Coefficient of Variation	0.212	Skewness	0.723

Normal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16.83	95% Adjusted-CLT UCL (Chen-1995)	16.9
		95% Modified-t UCL (Johnson-1978)	16.85

Gamma GOF Test

A-D Test Statistic	0.589	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.162	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma Statistics

k hat (MLE)	24.09	k star (bias corrected MLE)	19.62
Theta hat (MLE)	0.639	Theta star (bias corrected MLE)	0.785
nu hat (MLE)	771	nu star (bias corrected)	627.8
MLE Mean (bias corrected)	15.4	MLE Sd (bias corrected)	3.477
		Approximate Chi Square Value (0.05)	570.6
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	564.4

Assuming Gamma Distribution

95% Approximate Gamma UCL	16.94	95% Adjusted Gamma UCL	17.13

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.176	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.303	Mean of logged Data	2.713
Maximum of Logged Data	3.178	SD of logged Data	0.213

Assuming Lognormal Distribution

95% H-UCL	17.03	90% Chebyshev (MVUE) UCL	17.87
95% Chebyshev (MVUE) UCL	18.99	97.5% Chebyshev (MVUE) UCL	20.55
99% Chebyshev (MVUE) UCL	23.6		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	16.74	95% BCA Bootstrap UCL	16.85
95% Standard Bootstrap UCL	16.7	95% Bootstrap-t UCL	17.03
95% Hall's Bootstrap UCL	17.55	95% Percentile Bootstrap UCL	16.71
90% Chebyshev(Mean, Sd) UCL	17.85	95% Chebyshev(Mean, Sd) UCL	18.95
97.5% Chebyshev(Mean, Sd) UCL	20.49	99% Chebyshev(Mean, Sd) UCL	23.51

Suggested UCL to Use

95% Student's-t UCL	16.83

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chloride [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	6	Mean	11.58
Maximum	21	Median	11
SD	5.61	Std. Error of Mean	1.403

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Coefficient of Variation	0.485	Skewness	0.36

Normal GOF Test

Shapiro Wilk Test Statistic	0.851	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	14.03	95% Adjusted-CLT UCL (Chen-1995)	14.02
		95% Modified-t UCL (Johnson-1978)	14.05

Gamma GOF Test

A-D Test Statistic	1.086	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.236	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.216	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.445	k star (bias corrected MLE)	3.653
Theta hat (MLE)	2.604	Theta star (bias corrected MLE)	3.168
nu hat (MLE)	142.2	nu star (bias corrected)	116.9
MLE Mean (bias corrected)	11.58	MLE Sd (bias corrected)	6.056
		Approximate Chi Square Value (0.05)	92.94
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	90.51

Assuming Gamma Distribution

95% Approximate Gamma UCL	14.56	95% Adjusted Gamma UCL	14.95

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.233	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.792	Mean of logged Data	2.332
Maximum of Logged Data	3.045	SD of logged Data	0.505

Assuming Lognormal Distribution

95% H-UCL	15.3	90% Chebyshev (MVUE) UCL	16.13
95% Chebyshev (MVUE) UCL	18.19	97.5% Chebyshev (MVUE) UCL	21.04
99% Chebyshev (MVUE) UCL	26.63		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	13.88	95% BCA Bootstrap UCL	13.81
95% Standard Bootstrap UCL	13.82	95% Bootstrap-t UCL	14.28

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Hall's Bootstrap UCL	13.86	95% Percentile Bootstrap UCL	13.83
90% Chebyshev(Mean, Sd) UCL	15.78	95% Chebyshev(Mean, Sd) UCL	17.69
97.5% Chebyshev(Mean, Sd) UCL	20.33	99% Chebyshev(Mean, Sd) UCL	25.53

Suggested UCL to Use

95% Student's-t UCL	14.03

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
Number of Detects	15	Number of Non-Detects	1
Number of Distinct Detects	15	Number of Distinct Non-Detects	1
Minimum Detect	2.4	Minimum Non-Detect	2
Maximum Detect	127	Maximum Non-Detect	2
Variance Detects	1460	Percent Non-Detects	6.25%
Mean Detects	35.85	SD Detects	38.21
Median Detects	23.5	CV Detects	1.066
Skewness Detects	1.562	Kurtosis Detects	1.768
Mean of Logged Detects	3.024	SD of Logged Detects	1.157

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.794	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	33.73	KM Standard Error of Mean	9.488
90KM SD	36.67	95% KM (BCA) UCL	49.48
95% KM (t) UCL	50.36	95% KM (Percentile Bootstrap) UCL	49.48
95% KM (z) UCL	49.34	95% KM Bootstrap t UCL	63.07
90% KM Chebyshev UCL	62.2	95% KM Chebyshev UCL	75.09
97.5% KM Chebyshev UCL	92.98	99% KM Chebyshev UCL	128.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.275	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.136	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.228	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)	1.035	k star (bias corrected MLE)	0.873
Theta hat (MLE)	34.62	Theta star (bias corrected MLE)	41.07
nu hat (MLE)	31.06	nu star (bias corrected)	26.18
Mean (detects)	35.85		

Gamma ROS Statistics using Imputed Non-Detects

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	33.61
Maximum	127	Median	19.15
SD	37.98	CV	1.13
k hat (MLE)	0.634	k star (bias corrected MLE)	0.556
Theta hat (MLE)	53.04	Theta star (bias corrected MLE)	60.4
nu hat (MLE)	20.27	nu star (bias corrected)	17.81
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (17.81, α)	9.251	Adjusted Chi Square Value (17.81, β)	8.555
95% Gamma Approximate UCL	64.69	95% Gamma Adjusted UCL	69.94

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	33.73	SD (KM)	36.67
Variance (KM)	1344	SE of Mean (KM)	9.488
k hat (KM)	0.846	k star (KM)	0.729
nu hat (KM)	27.08	nu star (KM)	23.34
theta hat (KM)	39.86	theta star (KM)	46.25
80% gamma percentile (KM)	55.36	90% gamma percentile (KM)	83.86
95% gamma percentile (KM)	113.1	99% gamma percentile (KM)	182.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.34, α)	13.35	Adjusted Chi Square Value (23.34, β)	12.49
95% KM Approximate Gamma UCL	58.98	95% KM Adjusted Gamma UCL	63.02

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.0973	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	33.68	Mean in Log Scale	2.846
SD in Original Scale	37.91	SD in Log Scale	1.326
95% t UCL (assumes normality of ROS data)	50.3	95% Percentile Bootstrap UCL	49.36
95% BCA Bootstrap UCL	53.03	95% Bootstrap t UCL	61.34
95% H-UCL (Log ROS)	125.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.878	KM Geo Mean	17.79
KM SD (logged)	1.22	95% Critical H Value (KM-Log)	3.058
KM Standard Error of Mean (logged)	0.316	95% H-UCL (KM -Log)	98.12
KM SD (logged)	1.22	95% Critical H Value (KM-Log)	3.058
KM Standard Error of Mean (logged)	0.316		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	33.67	Mean in Log Scale	2.835
SD in Original Scale	37.92	SD in Log Scale	1.349
95% t UCL (Assumes normality)	50.29	95% H-Stat UCL	132.5

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	50.36

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
Number of Detects	10	Number of Non-Detects	6
Number of Distinct Detects	10	Number of Distinct Non-Detects	3
Minimum Detect	1.9	Minimum Non-Detect	1
Maximum Detect	24.1	Maximum Non-Detect	2
Variance Detects	44	Percent Non-Detects	37.5%
Mean Detects	7.4	SD Detects	6.633
Median Detects	5.15	CV Detects	0.896
Skewness Detects	2.046	Kurtosis Detects	4.714
Mean of Logged Detects	1.713	SD of Logged Detects	0.779

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.772	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.781	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.304	Detected Data appear Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.009	KM Standard Error of Mean	1.543
90KM SD	5.855	95% KM (BCA) UCL	7.844
95% KM (t) UCL	7.715	95% KM (Percentile Bootstrap) UCL	7.652
95% KM (z) UCL	7.548	95% KM Bootstrap t UCL	9.916
90% KM Chebyshev UCL	9.639	95% KM Chebyshev UCL	11.74
97.5% KM Chebyshev UCL	14.65	99% KM Chebyshev UCL	20.36

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.338	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.173	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.27	Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.883	k star (bias corrected MLE)	1.385
Theta hat (MLE)	3.929	Theta star (bias corrected MLE)	5.343
nu hat (MLE)	37.67	nu star (bias corrected)	27.7
Mean (detects)	7.4		

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	4.629
Maximum	24.1	Median	2.55
SD	6.329	CV	1.367
k hat (MLE)	0.313	k star (bias corrected MLE)	0.296
Theta hat (MLE)	14.79	Theta star (bias corrected MLE)	15.64
nu hat (MLE)	10.01	nu star (bias corrected)	9.469
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (9.47, α)	3.613	Adjusted Chi Square Value (9.47, β)	3.212
95% Gamma Approximate UCL	12.13	95% Gamma Adjusted UCL	13.65

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.009	SD (KM)	5.855
Variance (KM)	34.28	SE of Mean (KM)	1.543
k hat (KM)	0.732	k star (KM)	0.636
nu hat (KM)	23.42	nu star (KM)	20.36
theta hat (KM)	6.844	theta star (KM)	7.872
80% gamma percentile (KM)	8.253	90% gamma percentile (KM)	12.86
95% gamma percentile (KM)	17.65	99% gamma percentile (KM)	29.18

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.36, α)	11.12	Adjusted Chi Square Value (20.36, β)	10.35
95% KM Approximate Gamma UCL	9.174	95% KM Adjusted Gamma UCL	9.858

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.869	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.135	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.241	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.928	Mean in Log Scale	0.969
SD in Original Scale	6.107	SD in Log Scale	1.182
95% t UCL (assumes normality of ROS data)	7.604	95% Percentile Bootstrap UCL	7.467
95% BCA Bootstrap UCL	8.347	95% Bootstrap t UCL	9.896
95% H-UCL (Log ROS)	13.21		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.077	KM Geo Mean	2.937
KM SD (logged)	1.009	95% Critical H Value (KM-Log)	2.718

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

KM Standard Error of Mean (logged)	0.267	95% H-UCL (KM -Log)	9.927
KM SD (logged)	1.009	95% Critical H Value (KM-Log)	2.718
KM Standard Error of Mean (logged)	0.267		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.875	Mean in Log Scale	0.905
SD in Original Scale	6.144	SD in Log Scale	1.247
95% t UCL (Assumes normality)	7.568	95% H-Stat UCL	14.6

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 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	7.715

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
Number of Detects	7	Number of Non-Detects	9
Number of Distinct Detects	7	Number of Distinct Non-Detects	3
Minimum Detect	2	Minimum Non-Detect	1
Maximum Detect	13.7	Maximum Non-Detect	2
Variance Detects	17.77	Percent Non-Detects	56.25%
Mean Detects	5.371	SD Detects	4.215
Median Detects	3.3	CV Detects	0.785
Skewness Detects	1.655	Kurtosis Detects	2.147
Mean of Logged Detects	1.468	SD of Logged Detects	0.669

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.772	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.73	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.333	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.35	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.913	KM Standard Error of Mean	0.91
90KM SD	3.371	95% KM (BCA) UCL	4.5
95% KM (t) UCL	4.508	95% KM (Percentile Bootstrap) UCL	4.419
95% KM (z) UCL	4.41	95% KM Bootstrap t UCL	6.476
90% KM Chebyshev UCL	5.643	95% KM Chebyshev UCL	6.881
97.5% KM Chebyshev UCL	8.597	99% KM Chebyshev UCL	11.97

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.599	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.714	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.29	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.314	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	2.497	k star (bias corrected MLE)	1.522
Theta hat (MLE)	2.151	Theta star (bias corrected MLE)	3.529
nu hat (MLE)	34.96	nu star (bias corrected)	21.31
Mean (detects)	5.371		

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	2.356
Maximum	13.7	Median	0.01
SD	3.828	CV	1.625
k hat (MLE)	0.253	k star (bias corrected MLE)	0.247
Theta hat (MLE)	9.319	Theta star (bias corrected MLE)	9.535
nu hat (MLE)	8.088	nu star (bias corrected)	7.905
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (7.91, α)	2.68	Adjusted Chi Square Value (7.91, β)	2.346
95% Gamma Approximate UCL	6.948	95% Gamma Adjusted UCL	7.937

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.913	SD (KM)	3.371
Variance (KM)	11.36	SE of Mean (KM)	0.91
k hat (KM)	0.746	k star (KM)	0.648
nu hat (KM)	23.88	nu star (KM)	20.74
theta hat (KM)	3.902	theta star (KM)	4.494
80% gamma percentile (KM)	4.797	90% gamma percentile (KM)	7.443
95% gamma percentile (KM)	10.19	99% gamma percentile (KM)	16.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.74, α)	11.4	Adjusted Chi Square Value (20.74, β)	10.62
95% KM Approximate Gamma UCL	5.299	95% KM Adjusted Gamma UCL	5.69

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.895	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.838	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.248	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.28	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.697	Mean in Log Scale	0.294
SD in Original Scale	3.619	SD in Log Scale	1.224

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% t UCL (assumes normality of ROS data)	4.283	95% Percentile Bootstrap UCL	4.204
95% BCA Bootstrap UCL	4.733	95% Bootstrap t UCL	6.309
95% H-UCL (Log ROS)	7.471		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.642	KM Geo Mean	1.9
KM SD (logged)	0.835	95% Critical H Value (KM-Log)	2.461
KM Standard Error of Mean (logged)	0.226	95% H-UCL (KM -Log)	4.581
KM SD (logged)	0.835	95% Critical H Value (KM-Log)	2.461
KM Standard Error of Mean (logged)	0.226		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.725	Mean in Log Scale	0.397
SD in Original Scale	3.596	SD in Log Scale	1.08
95% t UCL (Assumes normality)	4.301	95% H-Stat UCL	5.865

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	4.508

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	10
Number of Detects	8	Number of Non-Detects	7
Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	1.3	Minimum Non-Detect	1
Maximum Detect	72.7	Maximum Non-Detect	1.5
Variance Detects	597	Percent Non-Detects	46.67%
Mean Detects	12.59	SD Detects	24.43
Median Detects	4.35	CV Detects	1.941
Skewness Detects	2.762	Kurtosis Detects	7.714
Mean of Logged Detects	1.531	SD of Logged Detects	1.328

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.516	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.749	Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.44	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.333	Detected Data Not Normal at 1% Significance Level	

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	7.204	KM Standard Error of Mean	4.874
90KM SD	17.66	95% KM (BCA) UCL	16.4
95% KM (t) UCL	15.79	95% KM (Percentile Bootstrap) UCL	16.28
95% KM (z) UCL	15.22	95% KM Bootstrap t UCL	62.42

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

90% KM Chebyshev UCL	21.83	95% KM Chebyshev UCL	28.45
97.5% KM Chebyshev UCL	37.64	99% KM Chebyshev UCL	55.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.941	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.754	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.312	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.307	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)	0.615	k star (bias corrected MLE)	0.467
Theta hat (MLE)	20.48	Theta star (bias corrected MLE)	26.93
nu hat (MLE)	9.834	nu star (bias corrected)	7.479
Mean (detects)	12.59		

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	6.719
Maximum	72.7	Median	1.3
SD	18.46	CV	2.747
k hat (MLE)	0.223	k star (bias corrected MLE)	0.223
Theta hat (MLE)	30.08	Theta star (bias corrected MLE)	30.11
nu hat (MLE)	6.702	nu star (bias corrected)	6.695
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (6.69, α)	2.005	Adjusted Chi Square Value (6.69, β)	1.705
95% Gamma Approximate UCL	22.44	95% Gamma Adjusted UCL	26.39

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	7.204	SD (KM)	17.66
Variance (KM)	311.8	SE of Mean (KM)	4.874
k hat (KM)	0.166	k star (KM)	0.178
nu hat (KM)	4.994	nu star (KM)	5.328
theta hat (KM)	43.28	theta star (KM)	40.56
80% gamma percentile (KM)	8.863	90% gamma percentile (KM)	21.71
95% gamma percentile (KM)	38.23	99% gamma percentile (KM)	84.64

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.33, α)	1.307	Adjusted Chi Square Value (5.33, β)	1.08
95% KM Approximate Gamma UCL	29.37	95% KM Adjusted Gamma UCL	35.54

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.851	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.265	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mean in Original Scale	6.839	Mean in Log Scale	0.0318
SD in Original Scale	18.41	SD in Log Scale	2.007
95% t UCL (assumes normality of ROS data)	15.21	95% Percentile Bootstrap UCL	15.9
95% BCA Bootstrap UCL	21.92	95% Bootstrap t UCL	55.86
95% H-UCL (Log ROS)	90.02		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.837	KM Geo Mean	2.308
KM SD (logged)	1.174	95% Critical H Value (KM-Log)	3.032
KM Standard Error of Mean (logged)	0.325	95% H-UCL (KM -Log)	11.91
KM SD (logged)	1.174	95% Critical H Value (KM-Log)	3.032
KM Standard Error of Mean (logged)	0.325		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	6.997	Mean in Log Scale	0.574
SD in Original Scale	18.35	SD in Log Scale	1.422
95% t UCL (Assumes normality)	15.34	95% H-Stat UCL	18.25

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 10% Significance Level

Suggested UCL to Use

KM H-UCL	11.91

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	11
Number of Detects	9	Number of Non-Detects	7
Number of Distinct Detects	8	Number of Distinct Non-Detects	3
Minimum Detect	1.2	Minimum Non-Detect	1
Maximum Detect	17.3	Maximum Non-Detect	2
Variance Detects	25.04	Percent Non-Detects	43.75%
Mean Detects	4.711	SD Detects	5.004
Median Detects	2.8	CV Detects	1.062
Skewness Detects	2.436	Kurtosis Detects	6.291
Mean of Logged Detects	1.221	SD of Logged Detects	0.788

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.667	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.764	Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.315	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.316	Detected Data appear Normal at 1% Significance Level	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Detected Data appear Approximate Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.107	KM Standard Error of Mean	1.056
90KM SD	3.98	95% KM (BCA) UCL	5.005
95% KM (t) UCL	4.957	95% KM (Percentile Bootstrap) UCL	4.95
95% KM (z) UCL	4.843	95% KM Bootstrap t UCL	8.842
90% KM Chebyshev UCL	6.273	95% KM Chebyshev UCL	7.708
97.5% KM Chebyshev UCL	9.699	99% KM Chebyshev UCL	13.61

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.683	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.303	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.283	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	1.666	k star (bias corrected MLE)	1.185
Theta hat (MLE)	2.828	Theta star (bias corrected MLE)	3.976
nu hat (MLE)	29.99	nu star (bias corrected)	21.33
Mean (detects)	4.711		

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	2.654
Maximum	17.3	Median	1.55
SD	4.377	CV	1.649
k hat (MLE)	0.299	k star (bias corrected MLE)	0.285
Theta hat (MLE)	8.867	Theta star (bias corrected MLE)	9.317
nu hat (MLE)	9.579	nu star (bias corrected)	9.117
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (9.12, α)	3.398	Adjusted Chi Square Value (9.12, β)	3.011
95% Gamma Approximate UCL	7.122	95% Gamma Adjusted UCL	8.037

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.107	SD (KM)	3.98
Variance (KM)	15.84	SE of Mean (KM)	1.056
k hat (KM)	0.609	k star (KM)	0.537
nu hat (KM)	19.5	nu star (KM)	17.18
theta hat (KM)	5.098	theta star (KM)	5.788
80% gamma percentile (KM)	5.115	90% gamma percentile (KM)	8.28
95% gamma percentile (KM)	11.64	99% gamma percentile (KM)	19.83

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.18, α)	8.799	Adjusted Chi Square Value (17.18, β)	8.123
95% KM Approximate Gamma UCL	6.065	95% KM Adjusted Gamma UCL	6.569

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.252	Detected Data Not Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.882	Mean in Log Scale	0.37
SD in Original Scale	4.239	SD in Log Scale	1.189
95% t UCL (assumes normality of ROS data)	4.739	95% Percentile Bootstrap UCL	4.703
95% BCA Bootstrap UCL	5.617	95% Bootstrap t UCL	7.68
95% H-UCL (Log ROS)	7.386		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.703	KM Geo Mean	2.019
KM SD (logged)	0.812	95% Critical H Value (KM-Log)	2.429
KM Standard Error of Mean (logged)	0.216	95% H-UCL (KM -Log)	4.676
KM SD (logged)	0.812	95% Critical H Value (KM-Log)	2.429
KM Standard Error of Mean (logged)	0.216		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.947	Mean in Log Scale	0.503
SD in Original Scale	4.2	SD in Log Scale	1.034
95% t UCL (Assumes normality)	4.787	95% H-Stat UCL	5.885

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 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	4.957

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	12
Number of Detects	9	Number of Non-Detects	7
Number of Distinct Detects	9	Number of Distinct Non-Detects	3
Minimum Detect	1.7	Minimum Non-Detect	1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum Detect	32.9	Maximum Non-Detect	2
Variance Detects	98.33	Percent Non-Detects	43.75%
Mean Detects	6.8	SD Detects	9.916
Median Detects	3.4	CV Detects	1.458
Skewness Detects	2.855	Kurtosis Detects	8.341
Mean of Logged Detects	1.424	SD of Logged Detects	0.893

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.536	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.764	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.409	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.316	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.269	KM Standard Error of Mean	2.009
90KM SD	7.577	95% KM (BCA) UCL	8.244
95% KM (t) UCL	7.791	95% KM (Percentile Bootstrap) UCL	8.006
95% KM (z) UCL	7.573	95% KM Bootstrap t UCL	18.41
90% KM Chebyshev UCL	10.3	95% KM Chebyshev UCL	13.03
97.5% KM Chebyshev UCL	16.82	99% KM Chebyshev UCL	24.26

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.07	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.741	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.296	**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)	1.152	k star (bias corrected MLE)	0.842
Theta hat (MLE)	5.904	Theta star (bias corrected MLE)	8.077
nu hat (MLE)	20.73	nu star (bias corrected)	15.15
Mean (detects)	6.8		

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	3.829
Maximum	32.9	Median	1.9
SD	8.034	CV	2.098
k hat (MLE)	0.274	k star (bias corrected MLE)	0.264
Theta hat (MLE)	13.99	Theta star (bias corrected MLE)	14.5
nu hat (MLE)	8.76	nu star (bias corrected)	8.451
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (8.45, α)	2.999	Adjusted Chi Square Value (8.45, β)	2.641
95% Gamma Approximate UCL	10.79	95% Gamma Adjusted UCL	12.25

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.269	SD (KM)	7.577
Variance (KM)	57.41	SE of Mean (KM)	2.009

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

k hat (KM)	0.317	k star (KM)	0.3
nu hat (KM)	10.16	nu star (KM)	9.586
theta hat (KM)	13.45	theta star (KM)	14.25
80% gamma percentile (KM)	6.544	90% gamma percentile (KM)	12.59
95% gamma percentile (KM)	19.54	99% gamma percentile (KM)	37.59

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.59, α)	3.685	Adjusted Chi Square Value (9.59, β)	3.279
95% KM Approximate Gamma UCL	11.11	95% KM Adjusted Gamma UCL	12.48

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.84	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.859	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.252	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.031	Mean in Log Scale	0.425
SD in Original Scale	7.936	SD in Log Scale	1.378
95% t UCL (assumes normality of ROS data)	7.509	95% Percentile Bootstrap UCL	7.683
95% BCA Bootstrap UCL	9.998	95% Bootstrap t UCL	16.17
95% H-UCL (Log ROS)	12.93		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.806	KM Geo Mean	2.238
KM SD (logged)	0.945	95% Critical H Value (KM-Log)	2.62
KM Standard Error of Mean (logged)	0.251	95% H-UCL (KM -Log)	6.625
KM SD (logged)	0.945	95% Critical H Value (KM-Log)	2.62
KM Standard Error of Mean (logged)	0.251		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.106	Mean in Log Scale	0.592
SD in Original Scale	7.9	SD in Log Scale	1.186
95% t UCL (Assumes normality)	7.568	95% H-Stat UCL	9.158

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 10% Significance Level

Suggested UCL to Use

KM H-UCL	6.625

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods,

then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (chromium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
Number of Detects	11	Number of Non-Detects	5
Number of Distinct Detects	11	Number of Distinct Non-Detects	2
Minimum Detect	1.6	Minimum Non-Detect	1
Maximum Detect	8.2	Maximum Non-Detect	2
Variance Detects	4.326	Percent Non-Detects	31.25%
Mean Detects	3.782	SD Detects	2.08
Median Detects	3.1	CV Detects	0.55
Skewness Detects	1	Kurtosis Detects	0.361
Mean of Logged Detects	1.199	SD of Logged Detects	0.533

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.792	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.291	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.927	KM Standard Error of Mean	0.546
90KM SD	2.079	95% KM (BCA) UCL	3.894
95% KM (t) UCL	3.883	95% KM (Percentile Bootstrap) UCL	3.806
95% KM (z) UCL	3.824	95% KM Bootstrap t UCL	4.163
90% KM Chebyshev UCL	4.564	95% KM Chebyshev UCL	5.305
97.5% KM Chebyshev UCL	6.334	99% KM Chebyshev UCL	8.355

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.292	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.135	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.256	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)	3.98	k star (bias corrected MLE)	2.955
Theta hat (MLE)	0.95	Theta star (bias corrected MLE)	1.28
nu hat (MLE)	87.57	nu star (bias corrected)	65.02
Mean (detects)	3.782		

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	8.2	Median	2.2
SD	2.422	CV	0.911
k hat (MLE)	0.607	k star (bias corrected MLE)	0.535
Theta hat (MLE)	4.378	Theta star (bias corrected MLE)	4.969
nu hat (MLE)	19.42	nu star (bias corrected)	17.11

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (17.11, α)	8.753	Adjusted Chi Square Value (17.11, β)	8.079
95% Gamma Approximate UCL	5.195	95% Gamma Adjusted UCL	5.628

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.927	SD (KM)	2.079
Variance (KM)	4.321	SE of Mean (KM)	0.546
k hat (KM)	1.983	k star (KM)	1.653
nu hat (KM)	63.46	nu star (KM)	52.89
theta hat (KM)	1.476	theta star (KM)	1.771
80% gamma percentile (KM)	4.48	90% gamma percentile (KM)	5.957
95% gamma percentile (KM)	7.383	99% gamma percentile (KM)	10.58

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (52.89, α)	37.19	Adjusted Chi Square Value (52.89, β)	35.69
95% KM Approximate Gamma UCL	4.163	95% KM Adjusted Gamma UCL	4.338

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.876	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.131	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.231	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.896	Mean in Log Scale	0.797
SD in Original Scale	2.178	SD in Log Scale	0.769
95% t UCL (assumes normality of ROS data)	3.85	95% Percentile Bootstrap UCL	3.772
95% BCA Bootstrap UCL	3.896	95% Bootstrap t UCL	4.155
95% H-UCL (Log ROS)	4.778		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.836	KM Geo Mean	2.306
KM SD (logged)	0.689	95% Critical H Value (KM-Log)	2.266
KM Standard Error of Mean (logged)	0.181	95% H-UCL (KM -Log)	4.374
KM SD (logged)	0.689	95% Critical H Value (KM-Log)	2.266
KM Standard Error of Mean (logged)	0.181		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.788	Mean in Log Scale	0.651
SD in Original Scale	2.284	SD in Log Scale	0.959
95% t UCL (Assumes normality)	3.789	95% H-Stat UCL	5.845

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3.883

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (chromium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	11
Number of Detects	10	Number of Non-Detects	6
Number of Distinct Detects	9	Number of Distinct Non-Detects	3
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	14.8	Maximum Non-Detect	2
Variance Detects	17.1	Percent Non-Detects	37.5%
Mean Detects	4.39	SD Detects	4.135
Median Detects	3	CV Detects	0.942
Skewness Detects	2.116	Kurtosis Detects	4.72
Mean of Logged Detects	1.181	SD of Logged Detects	0.776

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.741	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.781	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.318	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.304	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.128	KM Standard Error of Mean	0.923
90KM SD	3.504	95% KM (BCA) UCL	4.633
95% KM (t) UCL	4.746	95% KM (Percentile Bootstrap) UCL	4.613
95% KM (z) UCL	4.646	95% KM Bootstrap t UCL	6.931
90% KM Chebyshev UCL	5.898	95% KM Chebyshev UCL	7.153
97.5% KM Chebyshev UCL	8.894	99% KM Chebyshev UCL	12.32

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.46	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.224	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.27	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)	1.823	k star (bias corrected MLE)	1.343
Theta hat (MLE)	2.408	Theta star (bias corrected MLE)	3.269
nu hat (MLE)	36.46	nu star (bias corrected)	26.86
Mean (detects)	4.39		

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	2.748
Maximum	14.8	Median	1.8
SD	3.88	CV	1.412
k hat (MLE)	0.338	k star (bias corrected MLE)	0.316
Theta hat (MLE)	8.125	Theta star (bias corrected MLE)	8.683

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

nu hat (MLE)	10.82	nu star (bias corrected)	10.13
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (10.13, α)	4.02	Adjusted Chi Square Value (10.13, β)	3.593
95% Gamma Approximate UCL	6.92	95% Gamma Adjusted UCL	7.744

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.128	SD (KM)	3.504
Variance (KM)	12.28	SE of Mean (KM)	0.923
k hat (KM)	0.797	k star (KM)	0.689
nu hat (KM)	25.5	nu star (KM)	22.05
theta hat (KM)	3.925	theta star (KM)	4.538
80% gamma percentile (KM)	5.144	90% gamma percentile (KM)	7.88
95% gamma percentile (KM)	10.71	99% gamma percentile (KM)	17.46

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.05, α)	12.38	Adjusted Chi Square Value (22.05, β)	11.56
95% KM Approximate Gamma UCL	5.572	95% KM Adjusted Gamma UCL	5.967

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.869	Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.171	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.241	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.943	Mean in Log Scale	0.476
SD in Original Scale	3.741	SD in Log Scale	1.139
95% t UCL (assumes normality of ROS data)	4.582	95% Percentile Bootstrap UCL	4.528
95% BCA Bootstrap UCL	5.071	95% Bootstrap t UCL	6.433
95% H-UCL (Log ROS)	7.274		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.746	KM Geo Mean	2.108
KM SD (logged)	0.809	95% Critical H Value (KM-Log)	2.425
KM Standard Error of Mean (logged)	0.214	95% H-UCL (KM -Log)	4.856
KM SD (logged)	0.809	95% Critical H Value (KM-Log)	2.425
KM Standard Error of Mean (logged)	0.214		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.994	Mean in Log Scale	0.572
SD in Original Scale	3.706	SD in Log Scale	1.024
95% t UCL (Assumes normality)	4.618	95% H-Stat UCL	6.176

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	5.967	95% GROS Adjusted Gamma UCL	7.744

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 using results from simulation studies.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (chromium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	11
Number of Detects	13	Number of Non-Detects	3
Number of Distinct Detects	10	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	15	Maximum Non-Detect	2
Variance Detects	18.02	Percent Non-Detects	18.75%
Mean Detects	3.992	SD Detects	4.245
Median Detects	1.9	CV Detects	1.063
Skewness Detects	1.881	Kurtosis Detects	2.919
Mean of Logged Detects	1.007	SD of Logged Detects	0.829

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.681	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.814	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.343	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.271	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.46	KM Standard Error of Mean	1
90KM SD	3.842	95% KM (BCA) UCL	5.16
95% KM (t) UCL	5.213	95% KM (Percentile Bootstrap) UCL	5.119
95% KM (z) UCL	5.105	95% KM Bootstrap t UCL	6.421
90% KM Chebyshev UCL	6.46	95% KM Chebyshev UCL	7.818
97.5% KM Chebyshev UCL	9.704	99% KM Chebyshev UCL	13.41

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.352	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.751	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.287	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.241	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)	1.469	k star (bias corrected MLE)	1.182
Theta hat (MLE)	2.717	Theta star (bias corrected MLE)	3.379
nu hat (MLE)	38.21	nu star (bias corrected)	30.72
Mean (detects)	3.992		

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	3.271
Maximum	15	Median	1.75
SD	4.102	CV	1.254
k hat (MLE)	0.617	k star (bias corrected MLE)	0.543

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Theta hat (MLE)	5.299	Theta star (bias corrected MLE)	6.022
nu hat (MLE)	19.75	nu star (bias corrected)	17.38
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (17.38, α)	8.947	Adjusted Chi Square Value (17.38, β)	8.265
95% Gamma Approximate UCL	6.356	95% Gamma Adjusted UCL	6.881

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.46	SD (KM)	3.842
Variance (KM)	14.76	SE of Mean (KM)	1
k hat (KM)	0.811	k star (KM)	0.701
nu hat (KM)	25.95	nu star (KM)	22.42
theta hat (KM)	4.266	theta star (KM)	4.938
80% gamma percentile (KM)	5.687	90% gamma percentile (KM)	8.683
95% gamma percentile (KM)	11.77	99% gamma percentile (KM)	19.15

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.42, α)	12.65	Adjusted Chi Square Value (22.42, β)	11.82
95% KM Approximate Gamma UCL	6.13	95% KM Adjusted Gamma UCL	6.56

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.843	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.889	Detected Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.215	Detected Data Not Lognormal at 10% Significance Level	

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.38	Mean in Log Scale	0.732
SD in Original Scale	4.022	SD in Log Scale	0.975
95% t UCL (assumes normality of ROS data)	5.143	95% Percentile Bootstrap UCL	5.121
95% BCA Bootstrap UCL	5.628	95% Bootstrap t UCL	6.416
95% H-UCL (Log ROS)	6.543		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.84	KM Geo Mean	2.316
KM SD (logged)	0.803	95% Critical H Value (KM-Log)	2.417
KM Standard Error of Mean (logged)	0.21	95% H-UCL (KM -Log)	5.28
KM SD (logged)	0.803	95% Critical H Value (KM-Log)	2.417
KM Standard Error of Mean (logged)	0.21		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.369	Mean in Log Scale	0.732
SD in Original Scale	4.028	SD in Log Scale	0.96
95% t UCL (Assumes normality)	5.134	95% H-Stat UCL	6.344

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

Suggested UCL to Use

95% KM (t) UCL	5.213

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
Number of Detects	12	Number of Non-Detects	4
Number of Distinct Detects	12	Number of Distinct Non-Detects	2
Minimum Detect	1.5	Minimum Non-Detect	1
Maximum Detect	11	Maximum Non-Detect	2
Variance Detects	9.5	Percent Non-Detects	25%
Mean Detects	4.317	SD Detects	3.082
Median Detects	3.3	CV Detects	0.714
Skewness Detects	1.455	Kurtosis Detects	1.204
Mean of Logged Detects	1.265	SD of Logged Detects	0.635

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.805	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.239	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.281	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.504	KM Standard Error of Mean	0.763
90KM SD	2.92	95% KM (BCA) UCL	4.7
95% KM (t) UCL	4.841	95% KM (Percentile Bootstrap) UCL	4.713
95% KM (z) UCL	4.758	95% KM Bootstrap t UCL	6.015
90% KM Chebyshev UCL	5.792	95% KM Chebyshev UCL	6.828
97.5% KM Chebyshev UCL	8.267	99% KM Chebyshev UCL	11.09

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.464	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.174	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.248	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)	2.687	k star (bias corrected MLE)	2.071
Theta hat (MLE)	1.606	Theta star (bias corrected MLE)	2.084
nu hat (MLE)	64.49	nu star (bias corrected)	49.7
Mean (detects)	4.317		

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

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	3.24
Maximum	11	Median	2.5
SD	3.267	CV	1.008
k hat (MLE)	0.466	k star (bias corrected MLE)	0.42
Theta hat (MLE)	6.953	Theta star (bias corrected MLE)	7.709
nu hat (MLE)	14.91	nu star (bias corrected)	13.45
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (13.45, α)	6.196	Adjusted Chi Square Value (13.45, β)	5.644
95% Gamma Approximate UCL	7.033	95% Gamma Adjusted UCL	7.721

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.504	SD (KM)	2.92
Variance (KM)	8.524	SE of Mean (KM)	0.763
k hat (KM)	1.44	k star (KM)	1.212
nu hat (KM)	46.09	nu star (KM)	38.78
theta hat (KM)	2.433	theta star (KM)	2.891
80% gamma percentile (KM)	5.543	90% gamma percentile (KM)	7.694
95% gamma percentile (KM)	9.814	99% gamma percentile (KM)	14.67

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (38.78, α)	25.52	Adjusted Chi Square Value (38.78, β)	24.3
95% KM Approximate Gamma UCL	5.325	95% KM Adjusted Gamma UCL	5.593

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.883	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.145	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.223	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.45	Mean in Log Scale	0.9
SD in Original Scale	3.063	SD in Log Scale	0.86
95% t UCL (assumes normality of ROS data)	4.792	95% Percentile Bootstrap UCL	4.725
95% BCA Bootstrap UCL	4.999	95% Bootstrap t UCL	5.678
95% H-UCL (Log ROS)	6.201		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.961	KM Geo Mean	2.615
KM SD (logged)	0.748	95% Critical H Value (KM-Log)	2.342
KM Standard Error of Mean (logged)	0.196	95% H-UCL (KM -Log)	5.44
KM SD (logged)	0.748	95% Critical H Value (KM-Log)	2.342
KM Standard Error of Mean (logged)	0.196		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.394	Mean in Log Scale	0.819
SD in Original Scale	3.115	SD in Log Scale	0.978
95% t UCL (Assumes normality)	4.759	95% H-Stat UCL	7.184

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	4.841

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	5
Number of Detects	5	Number of Non-Detects	11
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	2.1	Maximum Non-Detect	2
Variance Detects	0.157	Percent Non-Detects	68.75%
Mean Detects	1.48	SD Detects	0.396
Median Detects	1.4	CV Detects	0.268
Skewness Detects	0.849	Kurtosis Detects	2.19
Mean of Logged Detects	0.364	SD of Logged Detects	0.264

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.686	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.28	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.396	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.156	KM Standard Error of Mean	0.0846
90KM SD	0.299	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.304	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.295	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.41	95% KM Chebyshev UCL	1.525
97.5% KM Chebyshev UCL	1.684	99% KM Chebyshev UCL	1.998

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.372	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.246	**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
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	18.04	k star (bias corrected MLE)	7.349
Theta hat (MLE)	0.082	Theta star (bias corrected MLE)	0.201
nu hat (MLE)	180.4	nu star (bias corrected)	73.49
Mean (detects)	1.48		

Gamma ROS Statistics using Imputed Non-Detects

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	0.784
Maximum	2.1	Median	0.688
SD	0.581	CV	0.741
k hat (MLE)	1.133	k star (bias corrected MLE)	0.962
Theta hat (MLE)	0.692	Theta star (bias corrected MLE)	0.815
nu hat (MLE)	36.26	nu star (bias corrected)	30.79
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (30.79, α)	19.12	Adjusted Chi Square Value (30.79, β)	18.07
95% Gamma Approximate UCL	1.263	95% Gamma Adjusted UCL	1.336

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.156	SD (KM)	0.299
Variance (KM)	0.0895	SE of Mean (KM)	0.0846
k hat (KM)	14.92	k star (KM)	12.17
nu hat (KM)	477.5	nu star (KM)	389.3
theta hat (KM)	0.0775	theta star (KM)	0.095
80% gamma percentile (KM)	1.422	90% gamma percentile (KM)	1.596
95% gamma percentile (KM)	1.749	99% gamma percentile (KM)	2.063

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (389.32, α)	344.6	Adjusted Chi Square Value (389.32, β)	339.8
95% KM Approximate Gamma UCL	1.306	95% KM Adjusted Gamma UCL	1.324

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.806	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.258	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.319	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.938	Mean in Log Scale	-0.163
SD in Original Scale	0.454	SD in Log Scale	0.455
95% t UCL (assumes normality of ROS data)	1.137	95% Percentile Bootstrap UCL	1.124
95% BCA Bootstrap UCL	1.153	95% Bootstrap t UCL	1.191
95% H-UCL (Log ROS)	1.193		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.119	KM Geo Mean	1.126
KM SD (logged)	0.216	95% Critical H Value (KM-Log)	1.81
KM Standard Error of Mean (logged)	0.0612	95% H-UCL (KM -Log)	1.275
KM SD (logged)	0.216	95% Critical H Value (KM-Log)	1.81
KM Standard Error of Mean (logged)	0.0612		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.838	Mean in Log Scale	-0.319
SD in Original Scale	0.507	SD in Log Scale	0.524

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% t UCL (Assumes normality)	1.06	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 Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.304

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	15
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 report_result_value (cobalt [ug/l]_intrawell_apw-05/05r) was not processed!

report_result_value (cobalt [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	6
Number of Detects	7	Number of Non-Detects	8
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	5.4	Maximum Non-Detect	2
Variance Detects	2.87	Percent Non-Detects	53.33%
Mean Detects	2.457	SD Detects	1.694
Median Detects	1.3	CV Detects	0.689
Skewness Detects	0.94	Kurtosis Detects	-0.415
Mean of Logged Detects	0.7	SD of Logged Detects	0.674

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.816	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.73	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.324	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.35	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.685	KM Standard Error of Mean	0.361
90KM SD	1.293	95% KM (BCA) UCL	2.29
95% KM (t) UCL	2.32	95% KM (Percentile Bootstrap) UCL	2.273
95% KM (z) UCL	2.278	95% KM Bootstrap t UCL	2.624
90% KM Chebyshev UCL	2.767	95% KM Chebyshev UCL	3.257

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

97.5% KM Chebyshev UCL	3.937	99% KM Chebyshev UCL	5.273

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.691	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.713	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.337	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.314	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	2.666	k star (bias corrected MLE)	1.618
Theta hat (MLE)	0.922	Theta star (bias corrected MLE)	1.518
nu hat (MLE)	37.32	nu star (bias corrected)	22.66
Mean (detects)	2.457		

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	1.153
Maximum	5.4	Median	0.025
SD	1.681	CV	1.458
k hat (MLE)	0.31	k star (bias corrected MLE)	0.293
Theta hat (MLE)	3.717	Theta star (bias corrected MLE)	3.94
nu hat (MLE)	9.307	nu star (bias corrected)	8.779
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (8.78, α)	3.194	Adjusted Chi Square Value (8.78, β)	2.792
95% Gamma Approximate UCL	3.169	95% Gamma Adjusted UCL	3.625

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.685	SD (KM)	1.293
Variance (KM)	1.671	SE of Mean (KM)	0.361
k hat (KM)	1.699	k star (KM)	1.404
nu hat (KM)	50.96	nu star (KM)	42.11
theta hat (KM)	0.992	theta star (KM)	1.2
80% gamma percentile (KM)	2.626	90% gamma percentile (KM)	3.568
95% gamma percentile (KM)	4.488	99% gamma percentile (KM)	6.574

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (42.11, α)	28.23	Adjusted Chi Square Value (42.11, β)	26.84
95% KM Approximate Gamma UCL	2.513	95% KM Adjusted Gamma UCL	2.643

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.838	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.313	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.28	Detected Data Not Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mean in Original Scale	1.354	Mean in Log Scale	-0.248
SD in Original Scale	1.546	SD in Log Scale	1.099
95% t UCL (assumes normality of ROS data)	2.057	95% Percentile Bootstrap UCL	2.018
95% BCA Bootstrap UCL	2.208	95% Bootstrap t UCL	2.475
95% H-UCL (Log ROS)	3.349		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.331	KM Geo Mean	1.392
KM SD (logged)	0.549	95% Critical H Value (KM-Log)	2.122
KM Standard Error of Mean (logged)	0.153	95% H-UCL (KM -Log)	2.211
KM SD (logged)	0.549	95% Critical H Value (KM-Log)	2.122
KM Standard Error of Mean (logged)	0.153		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.447	Mean in Log Scale	0.00313
SD in Original Scale	1.484	SD in Log Scale	0.824
95% t UCL (Assumes normality)	2.122	95% H-Stat UCL	2.433

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	2.32

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	15
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 report_result_value (cobalt [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (cobalt [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	2	Number of Non-Detects	14
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	1.3	Maximum Non-Detect	2
Variance Detects	0.045	Percent Non-Detects	87.5%
Mean Detects	1.15	SD Detects	0.212
Median Detects	1.15	CV Detects	0.184

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.131	SD of Logged Detects	0.186

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	1.02	KM Standard Error of Mean	0.0273
90KM SD	0.0748	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.068	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.065	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.102	95% KM Chebyshev UCL	1.139
97.5% KM Chebyshev UCL	1.191	99% KM Chebyshev UCL	1.292

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	58.44	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0197	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	233.8	nu star (bias corrected)	N/A
Mean (detects)	1.15		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.02	SD (KM)	0.0748
Variance (KM)	0.0056	SE of Mean (KM)	0.0273
k hat (KM)	185.8	k star (KM)	151
nu hat (KM)	5945	nu star (KM)	4832
theta hat (KM)	0.00549	theta star (KM)	0.00676
80% gamma percentile (KM)	1.089	90% gamma percentile (KM)	1.128
95% gamma percentile (KM)	1.16	99% gamma percentile (KM)	1.223

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0335
Approximate Chi Square Value (N/A, α)	4671	Adjusted Chi Square Value (N/A, β)	4653
95% KM Approximate Gamma UCL	1.055	95% KM Adjusted Gamma UCL	1.059

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	0.454	Mean in Log Scale	-0.99
SD in Original Scale	0.319	SD in Log Scale	0.651
95% t UCL (assumes normality of ROS data)	0.594	95% Percentile Bootstrap UCL	0.592
95% BCA Bootstrap UCL	0.614	95% Bootstrap t UCL	0.674
95% H-UCL (Log ROS)	0.667		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0175	KM Geo Mean	1.018
KM SD (logged)	0.0654	95% Critical H Value (KM-Log)	N/A

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

KM Standard Error of Mean (logged)	0.0239	95% H-UCL (KM -Log)	N/A
KM SD (logged)	0.0654	95% Critical H Value (KM-Log)	N/A
KM Standard Error of Mean (logged)	0.0239		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.613	Mean in Log Scale	-0.547
SD in Original Scale	0.25	SD in Log Scale	0.319
95% t UCL (Assumes normality)	0.722	95% H-Stat UCL	0.712

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

Suggested UCL to Use

95% KM (t) UCL	1.068

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
Number of Detects	11	Number of Non-Detects	5
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	2.1	Maximum Non-Detect	2
Variance Detects	0.134	Percent Non-Detects	31.25%
Mean Detects	1.518	SD Detects	0.366
Median Detects	1.4	CV Detects	0.241
Skewness Detects	0.363	Kurtosis Detects	-1.208
Mean of Logged Detects	0.391	SD of Logged Detects	0.241

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.792	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.179	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.291	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.374	KM Standard Error of Mean	0.0996
90KM SD	0.372	95% KM (BCA) UCL	1.531
95% KM (t) UCL	1.548	95% KM (Percentile Bootstrap) UCL	1.531
95% KM (z) UCL	1.537	95% KM Bootstrap t UCL	1.557
90% KM Chebyshev UCL	1.672	95% KM Chebyshev UCL	1.808
97.5% KM Chebyshev UCL	1.995	99% KM Chebyshev UCL	2.364

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.329	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.175	**Kolmogorov-Smirnov GOF**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

5% K-S Critical Value	0.255	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)	19.18	k star (bias corrected MLE)	14.01
Theta hat (MLE)	0.0792	Theta star (bias corrected MLE)	0.108
nu hat (MLE)	422	nu star (bias corrected)	308.2
Mean (detects)	1.518		

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	0.614	Mean	1.316
Maximum	2.1	Median	1.255
SD	0.445	CV	0.338
k hat (MLE)	8.993	k star (bias corrected MLE)	7.349
Theta hat (MLE)	0.146	Theta star (bias corrected MLE)	0.179
nu hat (MLE)	287.8	nu star (bias corrected)	235.2
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (235.16, α)	200.7	Adjusted Chi Square Value (235.16, β)	197
95% Gamma Approximate UCL	1.543	95% Gamma Adjusted UCL	1.571

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.374	SD (KM)	0.372
Variance (KM)	0.139	SE of Mean (KM)	0.0996
k hat (KM)	13.61	k star (KM)	11.1
nu hat (KM)	435.7	nu star (KM)	355.3
theta hat (KM)	0.101	theta star (KM)	0.124
80% gamma percentile (KM)	1.703	90% gamma percentile (KM)	1.921
95% gamma percentile (KM)	2.114	99% gamma percentile (KM)	2.509

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (355.30, α)	312.6	Adjusted Chi Square Value (355.30, β)	308.1
95% KM Approximate Gamma UCL	1.561	95% KM Adjusted Gamma UCL	1.584

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.876	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.231	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.334	Mean in Log Scale	0.242
SD in Original Scale	0.42	SD in Log Scale	0.316
95% t UCL (assumes normality of ROS data)	1.519	95% Percentile Bootstrap UCL	1.499
95% BCA Bootstrap UCL	1.504	95% Bootstrap t UCL	1.532
95% H-UCL (Log ROS)	1.562		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.283	KM Geo Mean	1.327

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

KM SD (logged)	0.26	95% Critical H Value (KM-Log)	1.841
KM Standard Error of Mean (logged)	0.0696	95% H-UCL (KM -Log)	1.552
KM SD (logged)	0.26	95% Critical H Value (KM-Log)	1.841
KM Standard Error of Mean (logged)	0.0696		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.231	Mean in Log Scale	0.0957
SD in Original Scale	0.544	SD in Log Scale	0.519
95% t UCL (Assumes normality)	1.47	95% H-Stat UCL	1.661

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.548

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	1.3	Mean	3.213
Maximum	7	Median	3.05
SD	1.328	Std. Error of Mean	0.332
Coefficient of Variation	0.413	Skewness	1.551

Normal GOF Test

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3.795	95% Adjusted-CLT UCL (Chen-1995)	3.897
		95% Modified-t UCL (Johnson-1978)	3.817

Gamma GOF Test

A-D Test Statistic	0.406	**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	0.145	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.216	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.102	k star (bias corrected MLE)	5.812

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Theta hat (MLE)	0.452	Theta star (bias corrected MLE)	0.553
nu hat (MLE)	227.3	nu star (bias corrected)	186
MLE Mean (bias corrected)	3.213	MLE Sd (bias corrected)	1.333
		Approximate Chi Square Value (0.05)	155.4
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	152.3

Assuming Gamma Distribution

95% Approximate Gamma UCL	3.845	95% Adjusted Gamma UCL	3.925

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.162	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.262	Mean of logged Data	1.095
Maximum of Logged Data	1.946	SD of logged Data	0.391

Assuming Lognormal Distribution

95% H-UCL	3.927	90% Chebyshev (MVUE) UCL	4.171
95% Chebyshev (MVUE) UCL	4.606	97.5% Chebyshev (MVUE) UCL	5.209
99% Chebyshev (MVUE) UCL	6.395		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	3.759	95% BCA Bootstrap UCL	3.863
95% Standard Bootstrap UCL	3.734	95% Bootstrap-t UCL	4.012
95% Hall's Bootstrap UCL	5.069	95% Percentile Bootstrap UCL	3.763
90% Chebyshev(Mean, Sd) UCL	4.209	95% Chebyshev(Mean, Sd) UCL	4.661
97.5% Chebyshev(Mean, Sd) UCL	5.287	99% Chebyshev(Mean, Sd) UCL	6.517

Suggested UCL to Use

95% Student's-t UCL	3.795

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (cobalt [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	4
Number of Detects	5	Number of Non-Detects	11
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	2.1	Maximum Non-Detect	2
Variance Detects	0.258	Percent Non-Detects	68.75%
Mean Detects	1.56	SD Detects	0.508
Median Detects	1.3	CV Detects	0.326
Skewness Detects	0.331	Kurtosis Detects	-2.788

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mean of Logged Detects	0.402	SD of Logged Detects	0.329

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.686	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.396	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.178	KM Standard Error of Mean	0.102
90KM SD	0.363	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.356	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.345	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.483	95% KM Chebyshev UCL	1.621
97.5% KM Chebyshev UCL	1.813	99% KM Chebyshev UCL	2.19

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.525	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.295	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	11.8	k star (bias corrected MLE)	4.854
Theta hat (MLE)	0.132	Theta star (bias corrected MLE)	0.321
nu hat (MLE)	118	nu star (bias corrected)	48.54
Mean (detects)	1.56		

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	0.693
Maximum	2.1	Median	0.477
SD	0.698	CV	1.006
k hat (MLE)	0.609	k star (bias corrected MLE)	0.537
Theta hat (MLE)	1.138	Theta star (bias corrected MLE)	1.292
nu hat (MLE)	19.5	nu star (bias corrected)	17.18
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (17.18, α)	8.8	Adjusted Chi Square Value (17.18, β)	8.124
95% Gamma Approximate UCL	1.354	95% Gamma Adjusted UCL	1.466

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.178	SD (KM)	0.363
Variance (KM)	0.132	SE of Mean (KM)	0.102
k hat (KM)	10.53	k star (KM)	8.6
nu hat (KM)	337.1	nu star (KM)	275.2
theta hat (KM)	0.112	theta star (KM)	0.137

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

80% gamma percentile (KM)	1.496	90% gamma percentile (KM)	1.713
95% gamma percentile (KM)	1.907	99% gamma percentile (KM)	2.307

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (275.19, α)	237.8	Adjusted Chi Square Value (275.19, β)	233.8
95% KM Approximate Gamma UCL	1.363	95% KM Adjusted Gamma UCL	1.386

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.806	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.264	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.319	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.879	Mean in Log Scale	-0.303
SD in Original Scale	0.565	SD in Log Scale	0.603
95% t UCL (assumes normality of ROS data)	1.126	95% Percentile Bootstrap UCL	1.108
95% BCA Bootstrap UCL	1.14	95% Bootstrap t UCL	1.209
95% H-UCL (Log ROS)	1.241		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.128	KM Geo Mean	1.137
KM SD (logged)	0.248	95% Critical H Value (KM-Log)	1.833
KM Standard Error of Mean (logged)	0.0698	95% H-UCL (KM -Log)	1.318
KM SD (logged)	0.248	95% Critical H Value (KM-Log)	1.833
KM Standard Error of Mean (logged)	0.0698		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.863	Mean in Log Scale	-0.308
SD in Original Scale	0.566	SD in Log Scale	0.549
95% t UCL (Assumes normality)	1.11	95% H-Stat UCL	1.152

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.356

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	820	Mean	880.8
Maximum	934	Median	882.5

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD	35.82	Std. Error of Mean	8.955
Coefficient of Variation	0.0407	Skewness	0.00833

Normal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.15	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	896.4	95% Adjusted-CLT UCL (Chen-1995)	895.5
		95% Modified-t UCL (Johnson-1978)	896.5

Gamma GOF Test

A-D Test Statistic	0.347	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	644.3	k star (bias corrected MLE)	523.5
Theta hat (MLE)	1.367	Theta star (bias corrected MLE)	1.682
nu hat (MLE)	20618	nu star (bias corrected)	16753
MLE Mean (bias corrected)	880.8	MLE Sd (bias corrected)	38.49
		Approximate Chi Square Value (0.05)	16454
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	16420

Assuming Gamma Distribution

95% Approximate Gamma UCL	896.8	95% Adjusted Gamma UCL	898.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.15	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.709	Mean of logged Data	6.78
Maximum of Logged Data	6.839	SD of logged Data	0.0407

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	907.6
95% Chebyshev (MVUE) UCL	919.8	97.5% Chebyshev (MVUE) UCL	936.7
99% Chebyshev (MVUE) UCL	970		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	895.5	95% BCA Bootstrap UCL	895.6

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Standard Bootstrap UCL	894.9	95% Bootstrap-t UCL	896
95% Hall's Bootstrap UCL	894.5	95% Percentile Bootstrap UCL	895.3
90% Chebyshev(Mean, Sd) UCL	907.6	95% Chebyshev(Mean, Sd) UCL	919.8
97.5% Chebyshev(Mean, Sd) UCL	936.7	99% Chebyshev(Mean, Sd) UCL	969.8

Suggested UCL to Use

95% Student's-t UCL	896.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	450	Mean	542.6
Maximum	724	Median	519
SD	76.63	Std. Error of Mean	19.16
Coefficient of Variation	0.141	Skewness	0.887

Normal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	576.1	95% Adjusted-CLT UCL (Chen-1995)	578.6
		95% Modified-t UCL (Johnson-1978)	576.9

Gamma GOF Test

A-D Test Statistic	0.399	**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	0.148	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	56.45	k star (bias corrected MLE)	45.91
Theta hat (MLE)	9.611	Theta star (bias corrected MLE)	11.82
nu hat (MLE)	1806	nu star (bias corrected)	1469
MLE Mean (bias corrected)	542.6	MLE Sd (bias corrected)	80.08
		Approximate Chi Square Value (0.05)	1381
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1371

Assuming Gamma Distribution

95% Approximate Gamma UCL	577.1	95% Adjusted Gamma UCL	581.2

Lognormal GOF Test

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.138	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.109	Mean of logged Data	6.287
Maximum of Logged Data	6.585	SD of logged Data	0.136

Assuming Lognormal Distribution

95% H-UCL	577.4	90% Chebyshev (MVUE) UCL	597.9
95% Chebyshev (MVUE) UCL	623.1	97.5% Chebyshev (MVUE) UCL	657.9
99% Chebyshev (MVUE) UCL	726.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	574.1	95% BCA Bootstrap UCL	577.4
95% Standard Bootstrap UCL	573.2	95% Bootstrap-t UCL	581.4
95% Hall's Bootstrap UCL	580.9	95% Percentile Bootstrap UCL	574.6
90% Chebyshev(Mean, Sd) UCL	600	95% Chebyshev(Mean, Sd) UCL	626.1
97.5% Chebyshev(Mean, Sd) UCL	662.2	99% Chebyshev(Mean, Sd) UCL	733.2

Suggested UCL to Use

95% Student's-t UCL	576.1

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	552	Mean	740.9
Maximum	842	Median	745
SD	79.41	Std. Error of Mean	19.85
Coefficient of Variation	0.107	Skewness	-0.756

Normal GOF Test

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.169	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	775.7	95% Adjusted-CLT UCL (Chen-1995)	769.5
		95% Modified-t UCL (Johnson-1978)	775.1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma GOF Test

A-D Test Statistic	0.421	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.177	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	87.24	k star (bias corrected MLE)	70.93
Theta hat (MLE)	8.492	Theta star (bias corrected MLE)	10.45
nu hat (MLE)	2792	nu star (bias corrected)	2270
MLE Mean (bias corrected)	740.9	MLE Sd (bias corrected)	87.97
		Approximate Chi Square Value (0.05)	2160
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2148

Assuming Gamma Distribution

95% Approximate Gamma UCL	778.5	95% Adjusted Gamma UCL	782.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.314	Mean of logged Data	6.602
Maximum of Logged Data	6.736	SD of logged Data	0.113

Assuming Lognormal Distribution

95% H-UCL	780	90% Chebyshev (MVUE) UCL	803.7
95% Chebyshev (MVUE) UCL	832.1	97.5% Chebyshev (MVUE) UCL	871.5
99% Chebyshev (MVUE) UCL	948.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	773.5	95% BCA Bootstrap UCL	768.6
95% Standard Bootstrap UCL	772.3	95% Bootstrap-t UCL	774
95% Hall's Bootstrap UCL	771.6	95% Percentile Bootstrap UCL	770.1
90% Chebyshev(Mean, Sd) UCL	800.4	95% Chebyshev(Mean, Sd) UCL	827.4
97.5% Chebyshev(Mean, Sd) UCL	864.9	99% Chebyshev(Mean, Sd) UCL	938.4

Suggested UCL to Use

95% Student's-t UCL	775.7

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	14	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	482	Mean	580.6
Maximum	735	Median	564.5
SD	59.4	Std. Error of Mean	15.88
Coefficient of Variation	0.102	Skewness	1.417

Normal GOF Test

Shapiro Wilk Test Statistic	0.817	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.825	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.294	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.263	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	608.7	95% Adjusted-CLT UCL (Chen-1995)	613.1
		95% Modified-t UCL (Johnson-1978)	609.7

Gamma GOF Test

A-D Test Statistic	1.169	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.733	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.277	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.228	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	109.9	k star (bias corrected MLE)	86.36
Theta hat (MLE)	5.285	Theta star (bias corrected MLE)	6.722
nu hat (MLE)	3076	nu star (bias corrected)	2418
MLE Mean (bias corrected)	580.6	MLE Sd (bias corrected)	62.47
		Approximate Chi Square Value (0.05)	2305
Adjusted Level of Significance	0.0312	Adjusted Chi Square Value	2290

Assuming Gamma Distribution

95% Approximate Gamma UCL	609.1	95% Adjusted Gamma UCL	613

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.847	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.895	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.273	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.208	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.178	Mean of logged Data	6.359
Maximum of Logged Data	6.6	SD of logged Data	0.0977

Assuming Lognormal Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	626
95% Chebyshev (MVUE) UCL	646.6	97.5% Chebyshev (MVUE) UCL	675.2
99% Chebyshev (MVUE) UCL	731.4		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	606.7	95% BCA Bootstrap UCL	611.1
95% Standard Bootstrap UCL	606.1	95% Bootstrap-t UCL	629.6
95% Hall's Bootstrap UCL	815.7	95% Percentile Bootstrap UCL	608.1
90% Chebyshev(Mean, Sd) UCL	628.2	95% Chebyshev(Mean, Sd) UCL	649.8
97.5% Chebyshev(Mean, Sd) UCL	679.7	99% Chebyshev(Mean, Sd) UCL	738.5

Suggested UCL to Use

95% Student's-t UCL	608.7

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	500	Mean	593.6
Maximum	666	Median	599
SD	45.29	Std. Error of Mean	11.32
Coefficient of Variation	0.0763	Skewness	-0.442

Normal GOF Test

Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.102	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	613.5	95% Adjusted-CLT UCL (Chen-1995)	610.9
		95% Modified-t UCL (Johnson-1978)	613.3

Gamma GOF Test

A-D Test Statistic	0.216	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.112	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	178.6	k star (bias corrected MLE)	145.2
Theta hat (MLE)	3.323	Theta star (bias corrected MLE)	4.089

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

nu hat (MLE)	5717	nu star (bias corrected)	4646
MLE Mean (bias corrected)	593.6	MLE Sd (bias corrected)	49.27
		Approximate Chi Square Value (0.05)	4489
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	4471

Assuming Gamma Distribution

95% Approximate Gamma UCL	614.4	95% Adjusted Gamma UCL	616.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.114	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.215	Mean of logged Data	6.383
Maximum of Logged Data	6.501	SD of logged Data	0.0778

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	628.3
95% Chebyshev (MVUE) UCL	644.1	97.5% Chebyshev (MVUE) UCL	665.9
99% Chebyshev (MVUE) UCL	708.7		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	612.2	95% BCA Bootstrap UCL	611.1
95% Standard Bootstrap UCL	612.1	95% Bootstrap-t UCL	613.3
95% Hall's Bootstrap UCL	612	95% Percentile Bootstrap UCL	612.1
90% Chebyshev(Mean, Sd) UCL	627.6	95% Chebyshev(Mean, Sd) UCL	643
97.5% Chebyshev(Mean, Sd) UCL	664.3	99% Chebyshev(Mean, Sd) UCL	706.3

Suggested UCL to Use

95% Student's-t UCL	613.5

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	624	Mean	749.3
Maximum	824	Median	741
SD	52.44	Std. Error of Mean	13.11
Coefficient of Variation	0.07	Skewness	-0.857

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Normal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.169	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	772.2	95% Adjusted-CLT UCL (Chen-1995)	767.8
		95% Modified-t UCL (Johnson-1978)	771.8

Gamma GOF Test

A-D Test Statistic	0.525	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.175	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	208.8	k star (bias corrected MLE)	169.7
Theta hat (MLE)	3.588	Theta star (bias corrected MLE)	4.415
nu hat (MLE)	6682	nu star (bias corrected)	5431
MLE Mean (bias corrected)	749.3	MLE Sd (bias corrected)	57.51
		Approximate Chi Square Value (0.05)	5260
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	5241

Assuming Gamma Distribution

95% Approximate Gamma UCL	773.5	95% Adjusted Gamma UCL	776.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.436	Mean of logged Data	6.617
Maximum of Logged Data	6.714	SD of logged Data	0.0723

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	790
95% Chebyshev (MVUE) UCL	808.4	97.5% Chebyshev (MVUE) UCL	833.9
99% Chebyshev (MVUE) UCL	884.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	770.8	95% BCA Bootstrap UCL	767.3
95% Standard Bootstrap UCL	770.5	95% Bootstrap-t UCL	770.2
95% Hall's Bootstrap UCL	769.4	95% Percentile Bootstrap UCL	769.4

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

90% Chebyshev(Mean, Sd) UCL	788.6	95% Chebyshev(Mean, Sd) UCL	806.4
97.5% Chebyshev(Mean, Sd) UCL	831.1	99% Chebyshev(Mean, Sd) UCL	879.7

Suggested UCL to Use

95% Student's-t UCL 772.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	370	Mean	413.8
Maximum	466	Median	415
SD	33.47	Std. Error of Mean	8.369
Coefficient of Variation	0.0809	Skewness	-0.00542

Normal GOF Test

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	428.5	95% Adjusted-CLT UCL (Chen-1995)	427.6
		95% Modified-t UCL (Johnson-1978)	428.5

Gamma GOF Test

A-D Test Statistic	0.594	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	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	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	162.4	k star (bias corrected MLE)	132
Theta hat (MLE)	2.549	Theta star (bias corrected MLE)	3.136
nu hat (MLE)	5196	nu star (bias corrected)	4223
MLE Mean (bias corrected)	413.8	MLE Sd (bias corrected)	36.02
		Approximate Chi Square Value (0.05)	4073
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	4056

Assuming Gamma Distribution

95% Approximate Gamma UCL	429.1	95% Adjusted Gamma UCL	430.8

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.19	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.914	Mean of logged Data	6.022
Maximum of Logged Data	6.144	SD of logged Data	0.0812

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	439
95% Chebyshev (MVUE) UCL	450.5	97.5% Chebyshev (MVUE) UCL	466.3
99% Chebyshev (MVUE) UCL	497.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	427.6	95% BCA Bootstrap UCL	427.2
95% Standard Bootstrap UCL	427.1	95% Bootstrap-t UCL	428.5
95% Hall's Bootstrap UCL	426.9	95% Percentile Bootstrap UCL	427.1
90% Chebyshev(Mean, Sd) UCL	438.9	95% Chebyshev(Mean, Sd) UCL	450.3
97.5% Chebyshev(Mean, Sd) UCL	466.1	99% Chebyshev(Mean, Sd) UCL	497.1

Suggested UCL to Use

95% Student's-t UCL	428.5

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	436	Mean	462.5
Maximum	512	Median	460
SD	19.3	Std. Error of Mean	4.824
Coefficient of Variation	0.0417	Skewness	1.076

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Normal Distribution

95% Normal UCL

95% Student's-t UCL	471

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	471.8
95% Modified-t UCL (Johnson-1978)	471.2

Gamma GOF Test

A-D Test Statistic	0.324	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.128	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	627.5	k star (bias corrected MLE)	509.9
Theta hat (MLE)	0.737	Theta star (bias corrected MLE)	0.907
nu hat (MLE)	20080	nu star (bias corrected)	16316
MLE Mean (bias corrected)	462.5	MLE Sd (bias corrected)	20.48
		Approximate Chi Square Value (0.05)	16020
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	15987

Assuming Gamma Distribution

95% Approximate Gamma UCL	471	95% Adjusted Gamma UCL	472

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.129	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.078	Mean of logged Data	6.136
Maximum of Logged Data	6.238	SD of logged Data	0.041

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	476.7
95% Chebyshev (MVUE) UCL	483.2	97.5% Chebyshev (MVUE) UCL	492.1
99% Chebyshev (MVUE) UCL	509.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	470.4	95% BCA Bootstrap UCL	471.2
95% Standard Bootstrap UCL	470	95% Bootstrap-t UCL	472.8
95% Hall's Bootstrap UCL	474.2	95% Percentile Bootstrap UCL	470.2
90% Chebyshev(Mean, Sd) UCL	477	95% Chebyshev(Mean, Sd) UCL	483.5
97.5% Chebyshev(Mean, Sd) UCL	492.6	99% Chebyshev(Mean, Sd) UCL	510.5

Suggested UCL to Use

95% Student's-t UCL	471

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (dissolved solids, total [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	678	Mean	747.1
Maximum	900	Median	735
SD	52.73	Std. Error of Mean	13.62
Coefficient of Variation	0.0706	Skewness	1.689

Normal GOF Test

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	771.1	95% Adjusted-CLT UCL (Chen-1995)	775.9
		95% Modified-t UCL (Johnson-1978)	772.1

Gamma GOF Test

A-D Test Statistic	0.547	**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	0.182	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	228.3	k star (bias corrected MLE)	182.7
Theta hat (MLE)	3.273	Theta star (bias corrected MLE)	4.09
nu hat (MLE)	6848	nu star (bias corrected)	5480
MLE Mean (bias corrected)	747.1	MLE Sd (bias corrected)	55.28
		Approximate Chi Square Value (0.05)	5309
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	5288

Assuming Gamma Distribution

95% Approximate Gamma UCL	771.2	95% Adjusted Gamma UCL	774.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.185	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.519	Mean of logged Data	6.614
Maximum of Logged Data	6.802	SD of logged Data	0.0676

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	786.2
95% Chebyshev (MVUE) UCL	803.9	97.5% Chebyshev (MVUE) UCL	828.5
99% Chebyshev (MVUE) UCL	876.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	769.5	95% BCA Bootstrap UCL	775.5
95% Standard Bootstrap UCL	769.2	95% Bootstrap-t UCL	780.2
95% Hall's Bootstrap UCL	874.9	95% Percentile Bootstrap UCL	772
90% Chebyshev(Mean, Sd) UCL	788	95% Chebyshev(Mean, Sd) UCL	806.5
97.5% Chebyshev(Mean, Sd) UCL	832.2	99% Chebyshev(Mean, Sd) UCL	882.6

Suggested UCL to Use

95% Student's-t UCL	771.1

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (fluoride [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	220	Mean	242.5
Maximum	260	Median	240
SD	12.91	Std. Error of Mean	3.227
Coefficient of Variation	0.0532	Skewness	-0.319

Normal GOF Test

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.173	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	248.2	95% Adjusted-CLT UCL (Chen-1995)	247.5
		95% Modified-t UCL (Johnson-1978)	248.1

Gamma GOF Test

A-D Test Statistic	0.553	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.178	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	371.7	k star (bias corrected MLE)	302.1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Theta hat (MLE)	0.652	Theta star (bias corrected MLE)	0.803
nu hat (MLE)	11895	nu star (bias corrected)	9666
MLE Mean (bias corrected)	242.5	MLE Sd (bias corrected)	13.95
		Approximate Chi Square Value (0.05)	9439
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	9413

Assuming Gamma Distribution

95% Approximate Gamma UCL	248.3	95% Adjusted Gamma UCL	249

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.183	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.394	Mean of logged Data	5.49
Maximum of Logged Data	5.561	SD of logged Data	0.0538

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	252.3
95% Chebyshev (MVUE) UCL	256.7	97.5% Chebyshev (MVUE) UCL	262.9
99% Chebyshev (MVUE) UCL	274.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	247.8	95% BCA Bootstrap UCL	246.9
95% Standard Bootstrap UCL	247.7	95% Bootstrap-t UCL	247.7
95% Hall's Bootstrap UCL	247.5	95% Percentile Bootstrap UCL	247.5
90% Chebyshev(Mean, Sd) UCL	252.2	95% Chebyshev(Mean, Sd) UCL	256.6
97.5% Chebyshev(Mean, Sd) UCL	262.7	99% Chebyshev(Mean, Sd) UCL	274.6

Suggested UCL to Use

95% Student's-t UCL	248.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (fluoride [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	200	Mean	264.5
Maximum	340	Median	265
SD	38.24	Std. Error of Mean	9.561

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Coefficient of Variation	0.145	Skewness	-0.0242

Normal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.127	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	281.3	95% Adjusted-CLT UCL (Chen-1995)	280.2
		95% Modified-t UCL (Johnson-1978)	281.3

Gamma GOF Test

A-D Test Statistic	0.298	**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	0.135	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	49.86	k star (bias corrected MLE)	40.55
Theta hat (MLE)	5.305	Theta star (bias corrected MLE)	6.523
nu hat (MLE)	1595	nu star (bias corrected)	1298
MLE Mean (bias corrected)	264.5	MLE Sd (bias corrected)	41.54
		Approximate Chi Square Value (0.05)	1215
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1206

Assuming Gamma Distribution

95% Approximate Gamma UCL	282.5	95% Adjusted Gamma UCL	284.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.13	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.298	Mean of logged Data	5.568
Maximum of Logged Data	5.829	SD of logged Data	0.148

Assuming Lognormal Distribution

95% H-UCL	283.2	90% Chebyshev (MVUE) UCL	293.9
95% Chebyshev (MVUE) UCL	307.3	97.5% Chebyshev (MVUE) UCL	325.7
99% Chebyshev (MVUE) UCL	362		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	280.2	95% BCA Bootstrap UCL	278.8
95% Standard Bootstrap UCL	279.7	95% Bootstrap-t UCL	281.1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Hall's Bootstrap UCL	280.8	95% Percentile Bootstrap UCL	279
90% Chebyshev(Mean, Sd) UCL	293.2	95% Chebyshev(Mean, Sd) UCL	306.2
97.5% Chebyshev(Mean, Sd) UCL	324.2	99% Chebyshev(Mean, Sd) UCL	359.6

Suggested UCL to Use

95% Student's-t UCL	281.3

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (fluoride [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	298	Mean	334.9
Maximum	380	Median	330
SD	23.01	Std. Error of Mean	5.753
Coefficient of Variation	0.0687	Skewness	0.326

Normal GOF Test

Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	345	95% Adjusted-CLT UCL (Chen-1995)	344.8
		95% Modified-t UCL (Johnson-1978)	345

Gamma GOF Test

A-D Test Statistic	0.298	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.141	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	227.8	k star (bias corrected MLE)	185.1
Theta hat (MLE)	1.47	Theta star (bias corrected MLE)	1.809
nu hat (MLE)	7290	nu star (bias corrected)	5924
MLE Mean (bias corrected)	334.9	MLE Sd (bias corrected)	24.61
		Approximate Chi Square Value (0.05)	5746
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	5726

Assuming Gamma Distribution

95% Approximate Gamma UCL	345.2	95% Adjusted Gamma UCL	346.4

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.138	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.697	Mean of logged Data	5.812
Maximum of Logged Data	5.94	SD of logged Data	0.0683

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	352
95% Chebyshev (MVUE) UCL	359.8	97.5% Chebyshev (MVUE) UCL	370.6
99% Chebyshev (MVUE) UCL	391.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	344.3	95% BCA Bootstrap UCL	344.4
95% Standard Bootstrap UCL	344.2	95% Bootstrap-t UCL	345.6
95% Hall's Bootstrap UCL	345.3	95% Percentile Bootstrap UCL	344.4
90% Chebyshev(Mean, Sd) UCL	352.1	95% Chebyshev(Mean, Sd) UCL	360
97.5% Chebyshev(Mean, Sd) UCL	370.8	99% Chebyshev(Mean, Sd) UCL	392.1

Suggested UCL to Use

95% Student's-t UCL	345

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (fluoride [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	200	Mean	218.1
Maximum	240	Median	220
SD	12.57	Std. Error of Mean	3.245
Coefficient of Variation	0.0576	Skewness	0.414

Normal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL **95% UCLs (Adjusted for Skewness)**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Student's-t UCL	223.8	95% Adjusted-CLT UCL (Chen-1995)	223.8
		95% Modified-t UCL (Johnson-1978)	223.9

Gamma GOF Test

A-D Test Statistic	0.495	**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	0.165	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	326.3	k star (bias corrected MLE)	261.1
Theta hat (MLE)	0.669	Theta star (bias corrected MLE)	0.836
nu hat (MLE)	9788	nu star (bias corrected)	7832
MLE Mean (bias corrected)	218.1	MLE Sd (bias corrected)	13.5
		Approximate Chi Square Value (0.05)	7627
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	7602

Assuming Gamma Distribution

95% Approximate Gamma UCL	224	95% Adjusted Gamma UCL	224.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.164	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.298	Mean of logged Data	5.384
Maximum of Logged Data	5.481	SD of logged Data	0.0572

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	227.8
95% Chebyshev (MVUE) UCL	232.2	97.5% Chebyshev (MVUE) UCL	238.3
99% Chebyshev (MVUE) UCL	250.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	223.5	95% BCA Bootstrap UCL	223.3
95% Standard Bootstrap UCL	223.2	95% Bootstrap-t UCL	224.5
95% Hall's Bootstrap UCL	224.1	95% Percentile Bootstrap UCL	223.3
90% Chebyshev(Mean, Sd) UCL	227.9	95% Chebyshev(Mean, Sd) UCL	232.3
97.5% Chebyshev(Mean, Sd) UCL	238.4	99% Chebyshev(Mean, Sd) UCL	250.4

Suggested UCL to Use

95% Student's-t UCL	223.8

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (fluoride [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	240	Mean	283.6
Maximum	410	Median	273.5
SD	42.43	Std. Error of Mean	10.61
Coefficient of Variation	0.15	Skewness	1.931

Normal GOF Test

Shapiro Wilk Test Statistic	0.814	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.19	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	302.2	95% Adjusted-CLT UCL (Chen-1995)	306.5
		95% Modified-t UCL (Johnson-1978)	303

Gamma GOF Test

A-D Test Statistic	0.744	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.166	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	54.4	k star (bias corrected MLE)	44.24
Theta hat (MLE)	5.213	Theta star (bias corrected MLE)	6.409
nu hat (MLE)	1741	nu star (bias corrected)	1416
MLE Mean (bias corrected)	283.6	MLE Sd (bias corrected)	42.63
		Approximate Chi Square Value (0.05)	1329
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1320

Assuming Gamma Distribution

95% Approximate Gamma UCL	302	95% Adjusted Gamma UCL	304.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.87	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.158	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.481	Mean of logged Data	5.638
Maximum of Logged Data	6.016	SD of logged Data	0.136

Assuming Lognormal Distribution

95% H-UCL	301.7	90% Chebyshev (MVUE) UCL	312.4

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Chebyshev (MVUE) UCL	325.5	97.5% Chebyshev (MVUE) UCL	343.7
99% Chebyshev (MVUE) UCL	379.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	301	95% BCA Bootstrap UCL	305.9
95% Standard Bootstrap UCL	300.3	95% Bootstrap-t UCL	314.5
95% Hall's Bootstrap UCL	375.6	95% Percentile Bootstrap UCL	300.6
90% Chebyshev(Mean, Sd) UCL	315.4	95% Chebyshev(Mean, Sd) UCL	329.8
97.5% Chebyshev(Mean, Sd) UCL	349.8	99% Chebyshev(Mean, Sd) UCL	389.1

Suggested UCL to Use

95% Student's-t UCL	302.2

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (fluoride [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	170	Mean	197.6
Maximum	350	Median	190
SD	42.42	Std. Error of Mean	10.61
Coefficient of Variation	0.215	Skewness	3.451

Normal GOF Test

Shapiro Wilk Test Statistic	0.539	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.353	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	216.2	95% Adjusted-CLT UCL (Chen-1995)	224.8
		95% Modified-t UCL (Johnson-1978)	217.7

Gamma GOF Test

A-D Test Statistic	2.144	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.325	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

k hat (MLE)	31.96	k star (bias corrected MLE)	26.01
Theta hat (MLE)	6.184	Theta star (bias corrected MLE)	7.599
nu hat (MLE)	1023	nu star (bias corrected)	832.2
MLE Mean (bias corrected)	197.6	MLE Sd (bias corrected)	38.75
		Approximate Chi Square Value (0.05)	766.3
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	759.1

Assuming Gamma Distribution

95% Approximate Gamma UCL	214.6	95% Adjusted Gamma UCL	216.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.632	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.31	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.136	Mean of logged Data	5.271
Maximum of Logged Data	5.858	SD of logged Data	0.17

Assuming Lognormal Distribution

95% H-UCL	213.4	90% Chebyshev (MVUE) UCL	222.3
95% Chebyshev (MVUE) UCL	233.8	97.5% Chebyshev (MVUE) UCL	249.6
99% Chebyshev (MVUE) UCL	280.7		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	215.1	95% BCA Bootstrap UCL	227.6
95% Standard Bootstrap UCL	214.3	95% Bootstrap-t UCL	246.8
95% Hall's Bootstrap UCL	285.8	95% Percentile Bootstrap UCL	217
90% Chebyshev(Mean, Sd) UCL	229.4	95% Chebyshev(Mean, Sd) UCL	243.9
97.5% Chebyshev(Mean, Sd) UCL	263.9	99% Chebyshev(Mean, Sd) UCL	303.1

Suggested UCL to Use

95% Student's-t UCL	216.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (fluoride [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	232	Mean	278.3
Maximum	300	Median	280
SD	19.07	Std. Error of Mean	4.768
Coefficient of Variation	0.0685	Skewness	-0.943

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Normal GOF Test

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.224	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	286.6	95% Adjusted-CLT UCL (Chen-1995)	284.9
		95% Modified-t UCL (Johnson-1978)	286.4

Gamma GOF Test

A-D Test Statistic	0.801	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.233	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	217.4	k star (bias corrected MLE)	176.7
Theta hat (MLE)	1.28	Theta star (bias corrected MLE)	1.575
nu hat (MLE)	6957	nu star (bias corrected)	5654
MLE Mean (bias corrected)	278.3	MLE Sd (bias corrected)	20.93
		Approximate Chi Square Value (0.05)	5480
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	5461

Assuming Gamma Distribution

95% Approximate Gamma UCL	287.1	95% Adjusted Gamma UCL	288.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.236	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.447	Mean of logged Data	5.626
Maximum of Logged Data	5.704	SD of logged Data	0.0709

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	293.1
95% Chebyshev (MVUE) UCL	299.8	97.5% Chebyshev (MVUE) UCL	309.1
99% Chebyshev (MVUE) UCL	327.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	286.1	95% BCA Bootstrap UCL	285
95% Standard Bootstrap UCL	286	95% Bootstrap-t UCL	285.6
95% Hall's Bootstrap UCL	285.1	95% Percentile Bootstrap UCL	285.6
90% Chebyshev(Mean, Sd) UCL	292.6	95% Chebyshev(Mean, Sd) UCL	299

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

97.5% Chebyshev(Mean, Sd) UCL	308	99% Chebyshev(Mean, Sd) UCL	325.7

Suggested UCL to Use

95% Student's-t UCL	286.6

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (fluoride [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	5
Number of Detects	13	Number of Non-Detects	3
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	100	Minimum Non-Detect	100
Maximum Detect	140	Maximum Non-Detect	150
Variance Detects	135.9	Percent Non-Detects	18.75%
Mean Detects	112.3	SD Detects	11.66
Median Detects	110	CV Detects	0.104
Skewness Detects	0.967	Kurtosis Detects	1.254
Mean of Logged Detects	4.716	SD of Logged Detects	0.101

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.814	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.271	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	110.7	KM Standard Error of Mean	3.019
90KM SD	11.23	95% KM (BCA) UCL	N/A
95% KM (t) UCL	116	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	115.6	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	119.7	95% KM Chebyshev UCL	123.8
97.5% KM Chebyshev UCL	129.5	99% KM Chebyshev UCL	140.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.7	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.187	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.236	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)	105.1	k star (bias corrected MLE)	80.9
Theta hat (MLE)	1.068	Theta star (bias corrected MLE)	1.388
nu hat (MLE)	2733	nu star (bias corrected)	2103
Mean (detects)	112.3		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	84.71	Mean	108.9
Maximum	140	Median	110
SD	13.52	CV	0.124
k hat (MLE)	69.55	k star (bias corrected MLE)	56.55
Theta hat (MLE)	1.566	Theta star (bias corrected MLE)	1.926
nu hat (MLE)	2225	nu star (bias corrected)	1810
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (N/A, α)	1712	Adjusted Chi Square Value (N/A, β)	1701
95% Gamma Approximate UCL	115.2	95% Gamma Adjusted UCL	115.9

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	110.7	SD (KM)	11.23
Variance (KM)	126.2	SE of Mean (KM)	3.019
k hat (KM)	97.03	k star (KM)	78.88
nu hat (KM)	3105	nu star (KM)	2524
theta hat (KM)	1.141	theta star (KM)	1.403
80% gamma percentile (KM)	121	90% gamma percentile (KM)	126.9
95% gamma percentile (KM)	131.9	99% gamma percentile (KM)	141.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	2408	Adjusted Chi Square Value (N/A, β)	2395
95% KM Approximate Gamma UCL	116	95% KM Adjusted Gamma UCL	116.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.889	Detected Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.179	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.215	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Approximate Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	109.1	Mean in Log Scale	4.686
SD in Original Scale	13.17	SD in Log Scale	0.12
95% t UCL (assumes normality of ROS data)	114.9	95% Percentile Bootstrap UCL	114.4
95% BCA Bootstrap UCL	114.4	95% Bootstrap t UCL	115.6
95% H-UCL (Log ROS)	115.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.702	KM Geo Mean	110.1
KM SD (logged)	0.0976	95% Critical H Value (KM-Log)	N/A
KM Standard Error of Mean (logged)	0.0262	95% H-UCL (KM -Log)	N/A
KM SD (logged)	0.0976	95% Critical H Value (KM-Log)	N/A
KM Standard Error of Mean (logged)	0.0262		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	102.2	Mean in Log Scale	4.591
SD in Original Scale	24.7	SD in Log Scale	0.297

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% t UCL (Assumes normality)	113	95% H-Stat UCL	118.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	116

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (fluoride [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
Number of Detects	15	Number of Non-Detects	1
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	150	Minimum Non-Detect	150
Maximum Detect	210	Maximum Non-Detect	150
Variance Detects	263.8	Percent Non-Detects	6.25%
Mean Detects	167.3	SD Detects	16.24
Median Detects	160	CV Detects	0.0971
Skewness Detects	1.42	Kurtosis Detects	2.372
Mean of Logged Detects	5.116	SD of Logged Detects	0.0925

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.854	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.235	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	166.3	KM Standard Error of Mean	4.079
90KM SD	15.76	95% KM (BCA) UCL	172.5
95% KM (t) UCL	173.4	95% KM (Percentile Bootstrap) UCL	173.1
95% KM (z) UCL	173	95% KM Bootstrap t UCL	176.7
90% KM Chebyshev UCL	178.5	95% KM Chebyshev UCL	184
97.5% KM Chebyshev UCL	191.7	99% KM Chebyshev UCL	206.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.739	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.734	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.219	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.221	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)	121.6	k star (bias corrected MLE)	97.33
Theta hat (MLE)	1.376	Theta star (bias corrected MLE)	1.719
nu hat (MLE)	3648	nu star (bias corrected)	2920
Mean (detects)	167.3		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	131.4	Mean	165.1
Maximum	210	Median	160
SD	18.07	CV	0.109
k hat (MLE)	91.88	k star (bias corrected MLE)	74.69
Theta hat (MLE)	1.797	Theta star (bias corrected MLE)	2.21
nu hat (MLE)	2940	nu star (bias corrected)	2390
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (N/A, α)	2278	Adjusted Chi Square Value (N/A, β)	2265
95% Gamma Approximate UCL	173.3	95% Gamma Adjusted UCL	174.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	166.3	SD (KM)	15.76
Variance (KM)	248.4	SE of Mean (KM)	4.079
k hat (KM)	111.3	k star (KM)	90.43
nu hat (KM)	3560	nu star (KM)	2894
theta hat (KM)	1.494	theta star (KM)	1.838
80% gamma percentile (KM)	180.8	90% gamma percentile (KM)	189
95% gamma percentile (KM)	196	99% gamma percentile (KM)	209.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	2770	Adjusted Chi Square Value (N/A, β)	2756
95% KM Approximate Gamma UCL	173.7	95% KM Adjusted Gamma UCL	174.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.879	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.202	Detected Data Not Lognormal at 10% Significance Level	

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	165.3	Mean in Log Scale	5.102
SD in Original Scale	17.76	SD in Log Scale	0.105
95% t UCL (assumes normality of ROS data)	173	95% Percentile Bootstrap UCL	172.5
95% BCA Bootstrap UCL	172.8	95% Bootstrap t UCL	174.9
95% H-UCL (Log ROS)	173.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.109	KM Geo Mean	165.6
KM SD (logged)	0.0902	95% Critical H Value (KM-Log)	N/A
KM Standard Error of Mean (logged)	0.0233	95% H-UCL (KM -Log)	N/A
KM SD (logged)	0.0902	95% Critical H Value (KM-Log)	N/A
KM Standard Error of Mean (logged)	0.0233		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	161.6	Mean in Log Scale	5.066

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD in Original Scale	27.91	SD in Log Scale	0.219
95% t UCL (Assumes normality)	173.8	95% H-Stat UCL	179.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use
95% KM (t) UCL 173.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (iron [mg/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	7.63	Mean	9.665
Maximum	11.7	Median	9.665

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 report_result_value (iron [mg/l]_intrawell_apw-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.

report_result_value (iron [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.367	Mean	1.014
Maximum	1.66	Median	1.014

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 report_result_value (iron [mg/l]_intrawell_apw-03) 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.

report_result_value (iron [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Minimum	2.77	Mean	4.33
Maximum	5.89	Median	4.33

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 report_result_value (iron [mg/l]_intrawell_apw-05/05r) 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.

report_result_value (iron [mg/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	3.65	Mean	3.65
Maximum	3.65	Median	3.65

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 report_result_value (iron [mg/l]_intrawell_apw-06d) 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.

report_result_value (iron [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	9.18	Mean	9.265
Maximum	9.35	Median	9.265

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 report_result_value (iron [mg/l]_intrawell_apw-06s) 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.

report_result_value (iron [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	17.3	Mean	18.1
Maximum	18.9	Median	18.1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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 report_result_value (iron [mg/l]_intrawell_apw-07) 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.

report_result_value (iron [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.44	Mean	1.79
Maximum	3.14	Median	1.79

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 report_result_value (iron [mg/l]_intrawell_apw-08) 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.

report_result_value (iron [mg/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.175	Mean	0.467
Maximum	0.758	Median	0.467

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 report_result_value (iron [mg/l]_intrawell_apw-10d) 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.

report_result_value (iron [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	17.2	Mean	18.4
Maximum	19.6	Median	18.4

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 report_result_value (iron [mg/l]_intrawell_apw-10s) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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.

report_result_value (lead [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	2	Mean	7.409
Maximum	23.9	Median	5.1
SD	6.594	Std. Error of Mean	1.648
Coefficient of Variation	0.89	Skewness	1.559

Normal GOF Test

Shapiro Wilk Test Statistic	0.791	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	10.3	95% Adjusted-CLT UCL (Chen-1995)	10.81
		95% Modified-t UCL (Johnson-1978)	10.41

Gamma GOF Test

A-D Test Statistic	0.627	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.753	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	0.218	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.714	k star (bias corrected MLE)	1.434
Theta hat (MLE)	4.323	Theta star (bias corrected MLE)	5.166
nu hat (MLE)	54.85	nu star (bias corrected)	45.9
MLE Mean (bias corrected)	7.409	MLE Sd (bias corrected)	6.187
		Approximate Chi Square Value (0.05)	31.36
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	29.99

Assuming Gamma Distribution

95% Approximate Gamma UCL	10.85	95% Adjusted Gamma UCL	11.34

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.166	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Minimum of Logged Data	0.693	Mean of logged Data	1.684
Maximum of Logged Data	3.174	SD of logged Data	0.804

Assuming Lognormal Distribution

95% H-UCL	12.29	90% Chebyshev (MVUE) UCL	11.94
95% Chebyshev (MVUE) UCL	14.06	97.5% Chebyshev (MVUE) UCL	17.01
99% Chebyshev (MVUE) UCL	22.8		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	10.12	95% BCA Bootstrap UCL	10.63
95% Standard Bootstrap UCL	10.03	95% Bootstrap-t UCL	12.37
95% Hall's Bootstrap UCL	12.9	95% Percentile Bootstrap UCL	10.03
90% Chebyshev(Mean, Sd) UCL	12.35	95% Chebyshev(Mean, Sd) UCL	14.59
97.5% Chebyshev(Mean, Sd) UCL	17.7	99% Chebyshev(Mean, Sd) UCL	23.81

Suggested UCL to Use

95% Student's-t UCL	10.3

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lead [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	10
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	1.3	Minimum Non-Detect	1
Maximum Detect	4.4	Maximum Non-Detect	2
Variance Detects	1.499	Percent Non-Detects	62.5%
Mean Detects	2.867	SD Detects	1.224
Median Detects	2.6	CV Detects	0.427
Skewness Detects	0.245	Kurtosis Detects	-1.525
Mean of Logged Detects	0.97	SD of Logged Detects	0.46

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.713	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.373	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.702	KM Standard Error of Mean	0.31
90KM SD	1.133	95% KM (BCA) UCL	2.238
95% KM (t) UCL	2.246	95% KM (Percentile Bootstrap) UCL	2.218

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% KM (z) UCL	2.212	95% KM Bootstrap t UCL	2.265
90% KM Chebyshev UCL	2.633	95% KM Chebyshev UCL	3.054
97.5% KM Chebyshev UCL	3.639	99% KM Chebyshev UCL	4.789

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.266	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.207	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	6.158	k star (bias corrected MLE)	3.19
Theta hat (MLE)	0.465	Theta star (bias corrected MLE)	0.899
nu hat (MLE)	73.9	nu star (bias corrected)	38.28
Mean (detects)	2.867		

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	1.182
Maximum	4.4	Median	0.383
SD	1.54	CV	1.303
k hat (MLE)	0.344	k star (bias corrected MLE)	0.321
Theta hat (MLE)	3.432	Theta star (bias corrected MLE)	3.676
nu hat (MLE)	11.02	nu star (bias corrected)	10.29
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (10.29, α)	4.121	Adjusted Chi Square Value (10.29, β)	3.687
95% Gamma Approximate UCL	2.949	95% Gamma Adjusted UCL	3.296

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.702	SD (KM)	1.133
Variance (KM)	1.283	SE of Mean (KM)	0.31
k hat (KM)	2.258	k star (KM)	1.876
nu hat (KM)	72.24	nu star (KM)	60.03
theta hat (KM)	0.754	theta star (KM)	0.907
80% gamma percentile (KM)	2.567	90% gamma percentile (KM)	3.36
95% gamma percentile (KM)	4.12	99% gamma percentile (KM)	5.811

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (60.03, α)	43.21	Adjusted Chi Square Value (60.03, β)	41.59
95% KM Approximate Gamma UCL	2.364	95% KM Adjusted Gamma UCL	2.456

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.943	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.826	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.298	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.482	Mean in Log Scale	0.0256
SD in Original Scale	1.335	SD in Log Scale	0.898
95% t UCL (assumes normality of ROS data)	2.067	95% Percentile Bootstrap UCL	2.018
95% BCA Bootstrap UCL	2.105	95% Bootstrap t UCL	2.306
95% H-UCL (Log ROS)	2.772		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.365	KM Geo Mean	1.441
KM SD (logged)	0.535	95% Critical H Value (KM-Log)	2.086
KM Standard Error of Mean (logged)	0.147	95% H-UCL (KM -Log)	2.217
KM SD (logged)	0.535	95% Critical H Value (KM-Log)	2.086
KM Standard Error of Mean (logged)	0.147		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.419	Mean in Log Scale	-0.0262
SD in Original Scale	1.362	SD in Log Scale	0.857
95% t UCL (Assumes normality)	2.016	95% H-Stat UCL	2.44

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	2.246

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lead [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	13
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	2.6	Maximum Non-Detect	2
Variance Detects	0.57	Percent Non-Detects	81.25%
Mean Detects	1.9	SD Detects	0.755
Median Detects	2	CV Detects	0.397
Skewness Detects	-0.586	Kurtosis Detects	N/A
Mean of Logged Detects	0.581	SD of Logged Detects	0.441

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	0.987	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.753	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.219	**Lilliefors GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1% Lilliefors Critical Value	0.429	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.169	KM Standard Error of Mean	0.135
90KM SD	0.441	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.406	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.391	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.574	95% KM Chebyshev UCL	1.758
97.5% KM Chebyshev UCL	2.013	99% KM Chebyshev UCL	2.513

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.295	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.636	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.271	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.433	Detected data appear Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	8.423	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.226	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	50.54	nu star (bias corrected)	N/A
Mean (detects)	1.9		

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	0.01	Mean	0.408
Maximum	2.6	Median	0.01
SD	0.801	CV	1.961
k hat (MLE)	0.3	k star (bias corrected MLE)	0.285
Theta hat (MLE)	1.363	Theta star (bias corrected MLE)	1.432
nu hat (MLE)	9.587	nu star (bias corrected)	9.123
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (9.12, α)	3.402	Adjusted Chi Square Value (9.12, β)	3.015
95% Gamma Approximate UCL	1.095	95% Gamma Adjusted UCL	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.169	SD (KM)	0.441
Variance (KM)	0.195	SE of Mean (KM)	0.135
k hat (KM)	7.028	k star (KM)	5.752
nu hat (KM)	224.9	nu star (KM)	184.1
theta hat (KM)	0.166	theta star (KM)	0.203
80% gamma percentile (KM)	1.548	90% gamma percentile (KM)	1.821
95% gamma percentile (KM)	2.069	99% gamma percentile (KM)	2.59

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (184.05, α)	153.7	Adjusted Chi Square Value (184.05, β)	150.5
95% KM Approximate Gamma UCL	1.4	95% KM Adjusted Gamma UCL	1.43

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.789	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.389	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.614	Mean in Log Scale	-1.018
SD in Original Scale	0.721	SD in Log Scale	1.059
95% t UCL (assumes normality of ROS data)	0.93	95% Percentile Bootstrap UCL	0.915
95% BCA Bootstrap UCL	0.982	95% Bootstrap t UCL	1.265
95% H-UCL (Log ROS)	1.361		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.109	KM Geo Mean	1.116
KM SD (logged)	0.275	95% Critical H Value (KM-Log)	1.852
KM Standard Error of Mean (logged)	0.0843	95% H-UCL (KM -Log)	1.322
KM SD (logged)	0.275	95% Critical H Value (KM-Log)	1.852
KM Standard Error of Mean (logged)	0.0843		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.794	Mean in Log Scale	-0.411
SD in Original Scale	0.627	SD in Log Scale	0.546
95% t UCL (Assumes normality)	1.068	95% H-Stat UCL	1.034

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.406

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lead [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	4
Number of Detects	2	Number of Non-Detects	13
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1.2	Minimum Non-Detect	1
Maximum Detect	1.6	Maximum Non-Detect	2
Variance Detects	0.08	Percent Non-Detects	86.67%
Mean Detects	1.4	SD Detects	0.283
Median Detects	1.4	CV Detects	0.202
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.326	SD of Logged Detects	0.203

Warning: Data set has only 2 Detected Values.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	1.057	KM Standard Error of Mean	0.0601
90KM SD	0.159	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.163	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.156	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.238	95% KM Chebyshev UCL	1.319
97.5% KM Chebyshev UCL	1.433	99% KM Chebyshev UCL	1.655

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	48.66	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0288	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	194.7	nu star (bias corrected)	N/A
Mean (detects)	1.4		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.057	SD (KM)	0.159
Variance (KM)	0.0253	SE of Mean (KM)	0.0601
k hat (KM)	44.16	k star (KM)	35.37
nu hat (KM)	1325	nu star (KM)	1061
theta hat (KM)	0.0239	theta star (KM)	0.0299
80% gamma percentile (KM)	1.203	90% gamma percentile (KM)	1.29
95% gamma percentile (KM)	1.365	99% gamma percentile (KM)	1.514

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0324
Approximate Chi Square Value (N/A, α)	986.6	Adjusted Chi Square Value (N/A, β)	977.7
95% KM Approximate Gamma UCL	1.137	95% KM Adjusted Gamma UCL	1.147

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	0.535	Mean in Log Scale	-0.856
SD in Original Scale	0.405	SD in Log Scale	0.699
95% t UCL (assumes normality of ROS data)	0.719	95% Percentile Bootstrap UCL	0.722
95% BCA Bootstrap UCL	0.748	95% Bootstrap t UCL	0.823
95% H-UCL (Log ROS)	0.834		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0466	KM Geo Mean	1.048
KM SD (logged)	0.126	95% Critical H Value (KM-Log)	1.764
KM Standard Error of Mean (logged)	0.0478	95% H-UCL (KM -Log)	1.121
KM SD (logged)	0.126	95% Critical H Value (KM-Log)	1.764
KM Standard Error of Mean (logged)	0.0478		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.653	Mean in Log Scale	-0.511
SD in Original Scale	0.338	SD in Log Scale	0.388
95% t UCL (Assumes normality)	0.807	95% H-Stat UCL	0.792

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

Suggested UCL to Use

95% KM (t) UCL	1.163

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lead [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	15
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 report_result_value (lead [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (lead [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	15
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 report_result_value (lead [ug/l]_intrawell_apw-07) was not processed!

report_result_value (lead [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	11
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	1.2	Minimum Non-Detect	1
Maximum Detect	2.8	Maximum Non-Detect	2
Variance Detects	0.428	Percent Non-Detects	68.75%
Mean Detects	1.94	SD Detects	0.654
Median Detects	1.8	CV Detects	0.337

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Skewness Detects	0.357	Kurtosis Detects	-1.657
Mean of Logged Detects	0.616	SD of Logged Detects	0.343

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.686	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.185	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.396	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.301	KM Standard Error of Mean	0.153
90KM SD	0.545	95% KM (BCA) UCL	1.55
95% KM (t) UCL	1.57	95% KM (Percentile Bootstrap) UCL	1.537
95% KM (z) UCL	1.553	95% KM Bootstrap t UCL	1.541
90% KM Chebyshev UCL	1.761	95% KM Chebyshev UCL	1.969
97.5% KM Chebyshev UCL	2.259	99% KM Chebyshev UCL	2.827

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.22	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.196	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	10.9	k star (bias corrected MLE)	4.495
Theta hat (MLE)	0.178	Theta star (bias corrected MLE)	0.432
nu hat (MLE)	109	nu star (bias corrected)	44.95
Mean (detects)	1.94		

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	0.814
Maximum	2.8	Median	0.488
SD	0.894	CV	1.097
k hat (MLE)	0.524	k star (bias corrected MLE)	0.468
Theta hat (MLE)	1.553	Theta star (bias corrected MLE)	1.742
nu hat (MLE)	16.78	nu star (bias corrected)	14.97
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (14.97, α)	7.238	Adjusted Chi Square Value (14.97, β)	6.633
95% Gamma Approximate UCL	1.684	95% Gamma Adjusted UCL	1.838

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.301	SD (KM)	0.545
Variance (KM)	0.297	SE of Mean (KM)	0.153
k hat (KM)	5.698	k star (KM)	4.672
nu hat (KM)	182.3	nu star (KM)	149.5

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

theta hat (KM)	0.228	theta star (KM)	0.278
80% gamma percentile (KM)	1.762	90% gamma percentile (KM)	2.107
95% gamma percentile (KM)	2.423	99% gamma percentile (KM)	3.091

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (149.49, α)	122.2	Adjusted Chi Square Value (149.49, β)	119.4
95% KM Approximate Gamma UCL	1.591	95% KM Adjusted Gamma UCL	1.628

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.806	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.175	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.319	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.058	Mean in Log Scale	-0.144
SD in Original Scale	0.728	SD in Log Scale	0.649
95% t UCL (assumes normality of ROS data)	1.377	95% Percentile Bootstrap UCL	1.349
95% BCA Bootstrap UCL	1.389	95% Bootstrap t UCL	1.484
95% H-UCL (Log ROS)	1.55		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.198	KM Geo Mean	1.219
KM SD (logged)	0.334	95% Critical H Value (KM-Log)	1.898
KM Standard Error of Mean (logged)	0.0942	95% H-UCL (KM -Log)	1.518
KM SD (logged)	0.334	95% Critical H Value (KM-Log)	1.898
KM Standard Error of Mean (logged)	0.0942		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.981	Mean in Log Scale	-0.241
SD in Original Scale	0.758	SD in Log Scale	0.645
95% t UCL (Assumes normality)	1.314	95% H-Stat UCL	1.4

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lead [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	2	Number of Non-Detects	14
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum Detect	2	Maximum Non-Detect	2
Variance Detects	0.5	Percent Non-Detects	87.5%
Mean Detects	1.5	SD Detects	0.707
Median Detects	1.5	CV Detects	0.471
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.347	SD of Logged Detects	0.49

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	1.063	KM Standard Error of Mean	0.0856
90KM SD	0.242	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.213	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.203	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.319	95% KM Chebyshev UCL	1.436
97.5% KM Chebyshev UCL	1.597	99% KM Chebyshev UCL	1.914

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	8.653	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.173	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	34.61	nu star (bias corrected)	N/A
Mean (detects)	1.5		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.063	SD (KM)	0.242
Variance (KM)	0.0586	SE of Mean (KM)	0.0856
k hat (KM)	19.27	k star (KM)	15.7
nu hat (KM)	616.5	nu star (KM)	502.3
theta hat (KM)	0.0551	theta star (KM)	0.0677
80% gamma percentile (KM)	1.279	90% gamma percentile (KM)	1.417
95% gamma percentile (KM)	1.539	99% gamma percentile (KM)	1.784

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0335
Approximate Chi Square Value (502.27, α)	451.3	Adjusted Chi Square Value (502.27, β)	445.8
95% KM Approximate Gamma UCL	1.183	95% KM Adjusted Gamma UCL	1.197

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	0.37	Mean in Log Scale	-1.596
SD in Original Scale	0.501	SD in Log Scale	1.113
95% t UCL (assumes normality of ROS data)	0.59	95% Percentile Bootstrap UCL	0.587
95% BCA Bootstrap UCL	0.688	95% Bootstrap t UCL	0.934
95% H-UCL (Log ROS)	0.862		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0433	KM Geo Mean	1.044
KM SD (logged)	0.168	95% Critical H Value (KM-Log)	1.78
KM Standard Error of Mean (logged)	0.0593	95% H-UCL (KM -Log)	1.144
KM SD (logged)	0.168	95% Critical H Value (KM-Log)	1.78
KM Standard Error of Mean (logged)	0.0593		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.656	Mean in Log Scale	-0.52
SD in Original Scale	0.397	SD in Log Scale	0.4
95% t UCL (Assumes normality)	0.83	95% H-Stat UCL	0.788

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

Suggested UCL to Use

95% KM (t) UCL	1.213

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lead [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	11
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	4.3	Maximum Non-Detect	2
Variance Detects	1.907	Percent Non-Detects	68.75%
Mean Detects	2.28	SD Detects	1.381
Median Detects	1.6	CV Detects	0.606
Skewness Detects	0.902	Kurtosis Detects	-0.919
Mean of Logged Detects	0.679	SD of Logged Detects	0.599

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.686	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.289	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.396	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.405	KM Standard Error of Mean	0.255
90KM SD	0.91	95% KM (BCA) UCL	1.837
95% KM (t) UCL	1.851	95% KM (Percentile Bootstrap) UCL	1.806
95% KM (z) UCL	1.824	95% KM Bootstrap t UCL	2.418
90% KM Chebyshev UCL	2.169	95% KM Chebyshev UCL	2.515
97.5% KM Chebyshev UCL	2.995	99% KM Chebyshev UCL	3.938

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.333	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.682	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.275	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.359	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	3.609	k star (bias corrected MLE)	1.577
Theta hat (MLE)	0.632	Theta star (bias corrected MLE)	1.446
nu hat (MLE)	36.09	nu star (bias corrected)	15.77
Mean (detects)	2.28		

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	0.731
Maximum	4.3	Median	0.01
SD	1.294	CV	1.77
k hat (MLE)	0.284	k star (bias corrected MLE)	0.272
Theta hat (MLE)	2.578	Theta star (bias corrected MLE)	2.687
nu hat (MLE)	9.075	nu star (bias corrected)	8.707
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (8.71, α)	3.151	Adjusted Chi Square Value (8.71, β)	2.782
95% Gamma Approximate UCL	2.02	95% Gamma Adjusted UCL	2.288

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.405	SD (KM)	0.91
Variance (KM)	0.827	SE of Mean (KM)	0.255
k hat (KM)	2.385	k star (KM)	1.98
nu hat (KM)	76.33	nu star (KM)	63.35
theta hat (KM)	0.589	theta star (KM)	0.71
80% gamma percentile (KM)	2.106	90% gamma percentile (KM)	2.739
95% gamma percentile (KM)	3.343	99% gamma percentile (KM)	4.684

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (63.35, α)	46.04	Adjusted Chi Square Value (63.35, β)	44.36
95% KM Approximate Gamma UCL	1.933	95% KM Adjusted Gamma UCL	2.006

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.806	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.237	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.319	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.947	Mean in Log Scale	-0.665

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD in Original Scale	1.182	SD in Log Scale	1.146
95% t UCL (assumes normality of ROS data)	1.465	95% Percentile Bootstrap UCL	1.437
95% BCA Bootstrap UCL	1.547	95% Bootstrap t UCL	1.996
95% H-UCL (Log ROS)	2.365		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.216	KM Geo Mean	1.241
KM SD (logged)	0.434	95% Critical H Value (KM-Log)	1.986
KM Standard Error of Mean (logged)	0.122	95% H-UCL (KM -Log)	1.704
KM SD (logged)	0.434	95% Critical H Value (KM-Log)	1.986
KM Standard Error of Mean (logged)	0.122		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.088	Mean in Log Scale	-0.221
SD in Original Scale	1.101	SD in Log Scale	0.72
95% t UCL (Assumes normality)	1.57	95% H-Stat UCL	1.594

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.851

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	38.6	Mean	49.49
Maximum	64.7	Median	48.7
SD	7.36	Std. Error of Mean	1.84
Coefficient of Variation	0.149	Skewness	0.501

Normal GOF Test

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	52.72	95% Adjusted-CLT UCL (Chen-1995)	52.77
		95% Modified-t UCL (Johnson-1978)	52.76

Gamma GOF Test

A-D Test Statistic	0.216	**Anderson-Darling Gamma GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.12	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	49.44	k star (bias corrected MLE)	40.21
Theta hat (MLE)	1.001	Theta star (bias corrected MLE)	1.231
nu hat (MLE)	1582	nu star (bias corrected)	1287
MLE Mean (bias corrected)	49.49	MLE Sd (bias corrected)	7.805
		Approximate Chi Square Value (0.05)	1205
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1196

Assuming Gamma Distribution

95% Approximate Gamma UCL	52.88	95% Adjusted Gamma UCL	53.28

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.109	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.653	Mean of logged Data	3.892
Maximum of Logged Data	4.17	SD of logged Data	0.146

Assuming Lognormal Distribution

95% H-UCL	52.95	90% Chebyshev (MVUE) UCL	54.94
95% Chebyshev (MVUE) UCL	57.41	97.5% Chebyshev (MVUE) UCL	60.84
99% Chebyshev (MVUE) UCL	67.58		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	52.52	95% BCA Bootstrap UCL	52.73
95% Standard Bootstrap UCL	52.42	95% Bootstrap-t UCL	53.07
95% Hall's Bootstrap UCL	52.97	95% Percentile Bootstrap UCL	52.31
90% Chebyshev(Mean, Sd) UCL	55.01	95% Chebyshev(Mean, Sd) UCL	57.51
97.5% Chebyshev(Mean, Sd) UCL	60.98	99% Chebyshev(Mean, Sd) UCL	67.8

Suggested UCL to Use

95% Student's-t UCL	52.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

		Number of Missing Observations	0
Minimum	23.9	Mean	29.69
Maximum	36.1	Median	29.9
SD	3.989	Std. Error of Mean	0.997
Coefficient of Variation	0.134	Skewness	0.149

Normal GOF Test

Shapiro Wilk Test Statistic	0.939	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	31.44	95% Adjusted-CLT UCL (Chen-1995)	31.37
		95% Modified-t UCL (Johnson-1978)	31.45

Gamma GOF Test

A-D Test Statistic	0.385	**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	0.133	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	59.12	k star (bias corrected MLE)	48.08
Theta hat (MLE)	0.502	Theta star (bias corrected MLE)	0.618
nu hat (MLE)	1892	nu star (bias corrected)	1538
MLE Mean (bias corrected)	29.69	MLE Sd (bias corrected)	4.283
		Approximate Chi Square Value (0.05)	1448
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1438

Assuming Gamma Distribution

95% Approximate Gamma UCL	31.54	95% Adjusted Gamma UCL	31.76

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.131	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.174	Mean of logged Data	3.382
Maximum of Logged Data	3.586	SD of logged Data	0.135

Assuming Lognormal Distribution

95% H-UCL	31.59	90% Chebyshev (MVUE) UCL	32.7
95% Chebyshev (MVUE) UCL	34.06	97.5% Chebyshev (MVUE) UCL	35.95
99% Chebyshev (MVUE) UCL	39.66		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nonparametric Distribution Free UCLs

95% CLT UCL	31.33	95% BCA Bootstrap UCL	31.38
95% Standard Bootstrap UCL	31.28	95% Bootstrap-t UCL	31.44
95% Hall's Bootstrap UCL	31.26	95% Percentile Bootstrap UCL	31.38
90% Chebyshev(Mean, Sd) UCL	32.69	95% Chebyshev(Mean, Sd) UCL	34.04
97.5% Chebyshev(Mean, Sd) UCL	35.92	99% Chebyshev(Mean, Sd) UCL	39.62

Suggested UCL to Use

95% Student's-t UCL	31.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	33.1	Mean	40.41
Maximum	52.3	Median	40.15
SD	4.228	Std. Error of Mean	1.057
Coefficient of Variation	0.105	Skewness	1.238

Normal GOF Test

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.15	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	42.26	95% Adjusted-CLT UCL (Chen-1995)	42.49
		95% Modified-t UCL (Johnson-1978)	42.31

Gamma GOF Test

A-D Test Statistic	0.446	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.135	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	103	k star (bias corrected MLE)	83.69
Theta hat (MLE)	0.392	Theta star (bias corrected MLE)	0.483
nu hat (MLE)	3295	nu star (bias corrected)	2678
MLE Mean (bias corrected)	40.41	MLE Sd (bias corrected)	4.417
		Approximate Chi Square Value (0.05)	2559
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2546

Assuming Gamma Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Approximate Gamma UCL	42.29	95% Adjusted Gamma UCL	42.51

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.13	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.5	Mean of logged Data	3.694
Maximum of Logged Data	3.957	SD of logged Data	0.101

Assuming Lognormal Distribution

95% H-UCL	42.29	90% Chebyshev (MVUE) UCL	43.46
95% Chebyshev (MVUE) UCL	44.84	97.5% Chebyshev (MVUE) UCL	46.76
99% Chebyshev (MVUE) UCL	50.54		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	42.14	95% BCA Bootstrap UCL	42.26
95% Standard Bootstrap UCL	42.07	95% Bootstrap-t UCL	42.81
95% Hall's Bootstrap UCL	44.3	95% Percentile Bootstrap UCL	42.1
90% Chebyshev(Mean, Sd) UCL	43.58	95% Chebyshev(Mean, Sd) UCL	45.01
97.5% Chebyshev(Mean, Sd) UCL	47.01	99% Chebyshev(Mean, Sd) UCL	50.92

Suggested UCL to Use

95% Student's-t UCL	42.26

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	16	Mean	17.35
Maximum	19.9	Median	17.3
SD	1.087	Std. Error of Mean	0.281
Coefficient of Variation	0.0626	Skewness	0.759

Normal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.117	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Normal UCL

95% Student's-t UCL	17.85

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	17.87
95% Modified-t UCL (Johnson-1978)	17.86

Gamma GOF Test

A-D Test Statistic	0.277
5% A-D Critical Value	0.734
K-S Test Statistic	0.126
5% K-S Critical Value	0.221

Anderson-Darling Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	279.6	k star (bias corrected MLE)	223.7
Theta hat (MLE)	0.0621	Theta star (bias corrected MLE)	0.0776
nu hat (MLE)	8387	nu star (bias corrected)	6711
MLE Mean (bias corrected)	17.35	MLE Sd (bias corrected)	1.16
		Approximate Chi Square Value (0.05)	6521
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	6498

Assuming Gamma Distribution

95% Approximate Gamma UCL	17.86	95% Adjusted Gamma UCL	17.92

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.947
10% Shapiro Wilk Critical Value	0.901
Lilliefors Test Statistic	0.118
10% Lilliefors Critical Value	0.202

Shapiro Wilk Lognormal GOF Test

Data appear Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.773	Mean of logged Data	2.852
Maximum of Logged Data	2.991	SD of logged Data	0.0616

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	18.18
95% Chebyshev (MVUE) UCL	18.56	97.5% Chebyshev (MVUE) UCL	19.08
99% Chebyshev (MVUE) UCL	20.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	17.81	95% BCA Bootstrap UCL	17.82
95% Standard Bootstrap UCL	17.8	95% Bootstrap-t UCL	17.91
95% Hall's Bootstrap UCL	17.95	95% Percentile Bootstrap UCL	17.83
90% Chebyshev(Mean, Sd) UCL	18.2	95% Chebyshev(Mean, Sd) UCL	18.58
97.5% Chebyshev(Mean, Sd) UCL	19.11	99% Chebyshev(Mean, Sd) UCL	20.15

Suggested UCL to Use

95% Student's-t UCL	17.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (lithium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	33.5	Mean	41.54
Maximum	56.4	Median	41.25
SD	4.997	Std. Error of Mean	1.249
Coefficient of Variation	0.12	Skewness	1.6

Normal GOF Test

Shapiro Wilk Test Statistic	0.841	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	43.73	95% Adjusted-CLT UCL (Chen-1995)	44.13
		95% Modified-t UCL (Johnson-1978)	43.82

Gamma GOF Test

A-D Test Statistic	0.841	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.25	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	80.1	k star (bias corrected MLE)	65.12
Theta hat (MLE)	0.519	Theta star (bias corrected MLE)	0.638
nu hat (MLE)	2563	nu star (bias corrected)	2084
MLE Mean (bias corrected)	41.54	MLE Sd (bias corrected)	5.148
		Approximate Chi Square Value (0.05)	1979
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1967

Assuming Gamma Distribution

95% Approximate Gamma UCL	43.75	95% Adjusted Gamma UCL	44.01

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.244	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.512	Mean of logged Data	3.72
Maximum of Logged Data	4.032	SD of logged Data	0.114

Assuming Lognormal Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% H-UCL	43.74	90% Chebyshev (MVUE) UCL	45.08
95% Chebyshev (MVUE) UCL	46.68	97.5% Chebyshev (MVUE) UCL	48.91
99% Chebyshev (MVUE) UCL	53.28		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	43.6	95% BCA Bootstrap UCL	44.04
95% Standard Bootstrap UCL	43.52	95% Bootstrap-t UCL	44.48
95% Hall's Bootstrap UCL	55.65	95% Percentile Bootstrap UCL	43.64
90% Chebyshev(Mean, Sd) UCL	45.29	95% Chebyshev(Mean, Sd) UCL	46.99
97.5% Chebyshev(Mean, Sd) UCL	49.35	99% Chebyshev(Mean, Sd) UCL	53.97

Suggested UCL to Use

95% Student's-t UCL	43.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	14.1	Mean	17.36
Maximum	23.1	Median	17.7
SD	2.241	Std. Error of Mean	0.56
Coefficient of Variation	0.129	Skewness	0.738

Normal GOF Test

Shapiro Wilk Test Statistic	0.921	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.156	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	18.34	95% Adjusted-CLT UCL (Chen-1995)	18.39
		95% Modified-t UCL (Johnson-1978)	18.36

Gamma GOF Test

A-D Test Statistic	0.422	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.14	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	66.06	k star (bias corrected MLE)	53.71
Theta hat (MLE)	0.263	Theta star (bias corrected MLE)	0.323

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

nu hat (MLE)	2114	nu star (bias corrected)	1719
MLE Mean (bias corrected)	17.36	MLE Sd (bias corrected)	2.368
		Approximate Chi Square Value (0.05)	1624
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1613

Assuming Gamma Distribution

95% Approximate Gamma UCL	18.37	95% Adjusted Gamma UCL	18.49

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.145	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.646	Mean of logged Data	2.846
Maximum of Logged Data	3.14	SD of logged Data	0.127

Assuming Lognormal Distribution

95% H-UCL	18.39	90% Chebyshev (MVUE) UCL	19.01
95% Chebyshev (MVUE) UCL	19.75	97.5% Chebyshev (MVUE) UCL	20.79
99% Chebyshev (MVUE) UCL	22.83		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	18.28	95% BCA Bootstrap UCL	18.37
95% Standard Bootstrap UCL	18.23	95% Bootstrap-t UCL	18.44
95% Hall's Bootstrap UCL	18.66	95% Percentile Bootstrap UCL	18.26
90% Chebyshev(Mean, Sd) UCL	19.04	95% Chebyshev(Mean, Sd) UCL	19.8
97.5% Chebyshev(Mean, Sd) UCL	20.86	99% Chebyshev(Mean, Sd) UCL	22.93

Suggested UCL to Use

95% Student's-t UCL	18.34

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	14.2	Mean	18.51
Maximum	22.3	Median	19.4
SD	2.775	Std. Error of Mean	0.694
Coefficient of Variation	0.15	Skewness	-0.222

Normal GOF Test

Shapiro Wilk Test Statistic	0.903	**Shapiro Wilk GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	19.72	95% Adjusted-CLT UCL (Chen-1995)	19.61
		95% Modified-t UCL (Johnson-1978)	19.72

Gamma GOF Test

A-D Test Statistic	0.723	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.194	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	45.94	k star (bias corrected MLE)	37.37
Theta hat (MLE)	0.403	Theta star (bias corrected MLE)	0.495
nu hat (MLE)	1470	nu star (bias corrected)	1196
MLE Mean (bias corrected)	18.51	MLE Sd (bias corrected)	3.027
		Approximate Chi Square Value (0.05)	1117
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1108

Assuming Gamma Distribution

95% Approximate Gamma UCL	19.82	95% Adjusted Gamma UCL	19.98

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.653	Mean of logged Data	2.907
Maximum of Logged Data	3.105	SD of logged Data	0.154

Assuming Lognormal Distribution

95% H-UCL	19.88	90% Chebyshev (MVUE) UCL	20.65
95% Chebyshev (MVUE) UCL	21.63	97.5% Chebyshev (MVUE) UCL	22.98
99% Chebyshev (MVUE) UCL	25.62		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	19.65	95% BCA Bootstrap UCL	19.58
95% Standard Bootstrap UCL	19.61	95% Bootstrap-t UCL	19.63
95% Hall's Bootstrap UCL	19.51	95% Percentile Bootstrap UCL	19.59
90% Chebyshev(Mean, Sd) UCL	20.59	95% Chebyshev(Mean, Sd) UCL	21.53
97.5% Chebyshev(Mean, Sd) UCL	22.84	99% Chebyshev(Mean, Sd) UCL	25.41

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Suggested UCL to Use

95% Student's-t UCL 19.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (lithium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	12.6	Mean	15.03
Maximum	18	Median	15
SD	1.119	Std. Error of Mean	0.28
Coefficient of Variation	0.0745	Skewness	0.603

Normal GOF Test

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.182	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	15.52	95% Adjusted-CLT UCL (Chen-1995)	15.53
		95% Modified-t UCL (Johnson-1978)	15.52

Gamma GOF Test

A-D Test Statistic	0.652	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.17	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	195	k star (bias corrected MLE)	158.5
Theta hat (MLE)	0.0771	Theta star (bias corrected MLE)	0.0948
nu hat (MLE)	6240	nu star (bias corrected)	5071
MLE Mean (bias corrected)	15.03	MLE Sd (bias corrected)	1.194
		Approximate Chi Square Value (0.05)	4906
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	4888

Assuming Gamma Distribution

95% Approximate Gamma UCL	15.53	95% Adjusted Gamma UCL	15.59

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lilliefors Test Statistic	0.175	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.534	Mean of logged Data	2.707
Maximum of Logged Data	2.89	SD of logged Data	0.0739

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	15.86
95% Chebyshev (MVUE) UCL	16.23	97.5% Chebyshev (MVUE) UCL	16.76
99% Chebyshev (MVUE) UCL	17.79		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	15.49	95% BCA Bootstrap UCL	15.53
95% Standard Bootstrap UCL	15.47	95% Bootstrap-t UCL	15.57
95% Hall's Bootstrap UCL	15.79	95% Percentile Bootstrap UCL	15.48
90% Chebyshev(Mean, Sd) UCL	15.86	95% Chebyshev(Mean, Sd) UCL	16.24
97.5% Chebyshev(Mean, Sd) UCL	16.77	99% Chebyshev(Mean, Sd) UCL	17.81

Suggested UCL to Use

95% Student's-t UCL	15.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (lithium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	26.3	Mean	30.94
Maximum	40.1	Median	30.4
SD	3.375	Std. Error of Mean	0.844
Coefficient of Variation	0.109	Skewness	1.32

Normal GOF Test

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	32.42	95% Adjusted-CLT UCL (Chen-1995)	32.62
		95% Modified-t UCL (Johnson-1978)	32.46

Gamma GOF Test

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

A-D Test Statistic	0.341	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.129	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	95.81	k star (bias corrected MLE)	77.89
Theta hat (MLE)	0.323	Theta star (bias corrected MLE)	0.397
nu hat (MLE)	3066	nu star (bias corrected)	2492
MLE Mean (bias corrected)	30.94	MLE Sd (bias corrected)	3.506
		Approximate Chi Square Value (0.05)	2377
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	2365

Assuming Gamma Distribution

95% Approximate Gamma UCL	32.43	95% Adjusted Gamma UCL	32.61

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.946	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.126	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.27	Mean of logged Data	3.427
Maximum of Logged Data	3.691	SD of logged Data	0.104

Assuming Lognormal Distribution

95% H-UCL	32.43	90% Chebyshev (MVUE) UCL	33.35
95% Chebyshev (MVUE) UCL	34.45	97.5% Chebyshev (MVUE) UCL	35.96
99% Chebyshev (MVUE) UCL	38.95		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	32.33	95% BCA Bootstrap UCL	32.55
95% Standard Bootstrap UCL	32.29	95% Bootstrap-t UCL	32.9
95% Hall's Bootstrap UCL	33.66	95% Percentile Bootstrap UCL	32.39
90% Chebyshev(Mean, Sd) UCL	33.47	95% Chebyshev(Mean, Sd) UCL	34.62
97.5% Chebyshev(Mean, Sd) UCL	36.21	99% Chebyshev(Mean, Sd) UCL	39.33

Suggested UCL to Use

95% Student's-t UCL	32.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (manganese [mg/l]_intrawell_apw-02)

General Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.669	Mean	0.711
Maximum	0.752	Median	0.711

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 report_result_value (manganese [mg/l]_intrawell_apw-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.

report_result_value (manganese [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.321	Mean	0.378
Maximum	0.435	Median	0.378

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 report_result_value (manganese [mg/l]_intrawell_apw-03) 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.

report_result_value (manganese [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.554	Mean	0.727
Maximum	0.9	Median	0.727

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 report_result_value (manganese [mg/l]_intrawell_apw-05/05r) 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.

report_result_value (manganese [mg/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	0.622	Mean	0.622

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum	0.622	Median	0.622

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 report_result_value (manganese [mg/l]_intrawell_apw-06d) 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.

report_result_value (manganese [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.512	Mean	0.521
Maximum	0.53	Median	0.521

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 report_result_value (manganese [mg/l]_intrawell_apw-06s) 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.

report_result_value (manganese [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	1.11	Mean	1.15
Maximum	1.19	Median	1.15

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 report_result_value (manganese [mg/l]_intrawell_apw-07) 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.

report_result_value (manganese [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.0435	Mean	0.123
Maximum	0.202	Median	0.123

Warning: This data set only has 2 observations!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable report_result_value (manganese [mg/l]_intrawell_apw-08) 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.

report_result_value (manganese [mg/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.88	Mean	1.02
Maximum	1.16	Median	1.02

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 report_result_value (manganese [mg/l]_intrawell_apw-10d) 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.

report_result_value (manganese [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.174	Mean	0.209
Maximum	0.243	Median	0.209

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 report_result_value (manganese [mg/l]_intrawell_apw-10s) 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.

report_result_value (mercury [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-02) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (mercury [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-03) was not processed!

report_result_value (mercury [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-05/05r) was not processed!

report_result_value (mercury [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	15
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-06d) was not processed!

report_result_value (mercury [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-06s) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (mercury [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-07) was not processed!

report_result_value (mercury [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-08) was not processed!

report_result_value (mercury [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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 report_result_value (mercury [ug/l]_intrawell_apw-10d) was not processed!

report_result_value (mercury [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	16
Number of Distinct Detects	0	Number of Distinct Non-Detects	1

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).

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

The data set for variable report_result_value (mercury [ug/l]_intrawell_apw-10s) was not processed!

report_result_value (molybdenum [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	95.1	Mean	165.6
Maximum	240	Median	165
SD	40.38	Std. Error of Mean	10.1
Coefficient of Variation	0.244	Skewness	0.228

Normal GOF Test

Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	183.3	95% Adjusted-CLT UCL (Chen-1995)	182.8
		95% Modified-t UCL (Johnson-1978)	183.4

Gamma GOF Test

A-D Test Statistic	0.192	**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	0.127	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	17.44	k star (bias corrected MLE)	14.21
Theta hat (MLE)	9.496	Theta star (bias corrected MLE)	11.65
nu hat (MLE)	558	nu star (bias corrected)	454.7
MLE Mean (bias corrected)	165.6	MLE Sd (bias corrected)	43.92
		Approximate Chi Square Value (0.05)	406.2
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	401

Assuming Gamma Distribution

95% Approximate Gamma UCL	185.3	95% Adjusted Gamma UCL	187.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.119	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.555	Mean of logged Data	5.08

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum of Logged Data	5.481	SD of logged Data	0.252

Assuming Lognormal Distribution

95% H-UCL	187.1	90% Chebyshev (MVUE) UCL	197.3
95% Chebyshev (MVUE) UCL	211.6	97.5% Chebyshev (MVUE) UCL	231.5
99% Chebyshev (MVUE) UCL	270.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	182.2	95% BCA Bootstrap UCL	181.3
95% Standard Bootstrap UCL	181.2	95% Bootstrap-t UCL	183.6
95% Hall's Bootstrap UCL	183.1	95% Percentile Bootstrap UCL	180.9
90% Chebyshev(Mean, Sd) UCL	195.9	95% Chebyshev(Mean, Sd) UCL	209.6
97.5% Chebyshev(Mean, Sd) UCL	228.6	99% Chebyshev(Mean, Sd) UCL	266

Suggested UCL to Use

95% Student's-t UCL	183.3

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (molybdenum [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	26.2	Mean	62.29
Maximum	84.9	Median	65.25
SD	17.6	Std. Error of Mean	4.4
Coefficient of Variation	0.283	Skewness	-0.762

Normal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.136	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	70	95% Adjusted-CLT UCL (Chen-1995)	68.63
		95% Modified-t UCL (Johnson-1978)	69.86

Gamma GOF Test

A-D Test Statistic	0.707	**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	0.16	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma Statistics

k hat (MLE)	10.64	k star (bias corrected MLE)	8.683
Theta hat (MLE)	5.857	Theta star (bias corrected MLE)	7.174
nu hat (MLE)	340.3	nu star (bias corrected)	277.9
MLE Mean (bias corrected)	62.29	MLE Sd (bias corrected)	21.14
		Approximate Chi Square Value (0.05)	240.2
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	236.3

Assuming Gamma Distribution

95% Approximate Gamma UCL	72.04	95% Adjusted Gamma UCL	73.25

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.178	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.266	Mean of logged Data	4.084
Maximum of Logged Data	4.441	SD of logged Data	0.341

Assuming Lognormal Distribution

95% H-UCL	74.43	90% Chebyshev (MVUE) UCL	78.99
95% Chebyshev (MVUE) UCL	86.37	97.5% Chebyshev (MVUE) UCL	96.61
99% Chebyshev (MVUE) UCL	116.7		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	69.52	95% BCA Bootstrap UCL	68.38
95% Standard Bootstrap UCL	69.24	95% Bootstrap-t UCL	68.95
95% Hall's Bootstrap UCL	68.56	95% Percentile Bootstrap UCL	68.88
90% Chebyshev(Mean, Sd) UCL	75.49	95% Chebyshev(Mean, Sd) UCL	81.47
97.5% Chebyshev(Mean, Sd) UCL	89.77	99% Chebyshev(Mean, Sd) UCL	106.1

Suggested UCL to Use

95% Student's-t UCL	70

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (molybdenum [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	168	Mean	213.2

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum	249	Median	214.5
SD	24.52	Std. Error of Mean	6.129
Coefficient of Variation	0.115	Skewness	-0.284

Normal GOF Test

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.0986	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	223.9	95% Adjusted-CLT UCL (Chen-1995)	222.8
		95% Modified-t UCL (Johnson-1978)	223.9

Gamma GOF Test

A-D Test Statistic	0.264	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.107	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	78.16	k star (bias corrected MLE)	63.55
Theta hat (MLE)	2.728	Theta star (bias corrected MLE)	3.355
nu hat (MLE)	2501	nu star (bias corrected)	2033
MLE Mean (bias corrected)	213.2	MLE Sd (bias corrected)	26.74
		Approximate Chi Square Value (0.05)	1930
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1918

Assuming Gamma Distribution

95% Approximate Gamma UCL	224.6	95% Adjusted Gamma UCL	226

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.106	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.124	Mean of logged Data	5.356
Maximum of Logged Data	5.517	SD of logged Data	0.118

Assuming Lognormal Distribution

95% H-UCL	225	90% Chebyshev (MVUE) UCL	232.1
95% Chebyshev (MVUE) UCL	240.7	97.5% Chebyshev (MVUE) UCL	252.6
99% Chebyshev (MVUE) UCL	275.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% CLT UCL	223.3	95% BCA Bootstrap UCL	222.4
95% Standard Bootstrap UCL	223.2	95% Bootstrap-t UCL	223.8
95% Hall's Bootstrap UCL	223.1	95% Percentile Bootstrap UCL	222.7
90% Chebyshev(Mean, Sd) UCL	231.6	95% Chebyshev(Mean, Sd) UCL	239.9
97.5% Chebyshev(Mean, Sd) UCL	251.5	99% Chebyshev(Mean, Sd) UCL	274.2

Suggested UCL to Use

95% Student's-t UCL	223.9

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (molybdenum [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	46.3	Mean	60.46
Maximum	71.9	Median	60.2
SD	7.409	Std. Error of Mean	1.913
Coefficient of Variation	0.123	Skewness	-0.521

Normal GOF Test

Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	63.83	95% Adjusted-CLT UCL (Chen-1995)	63.33
		95% Modified-t UCL (Johnson-1978)	63.79

Gamma GOF Test

A-D Test Statistic	0.576	**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	0.193	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	67.54	k star (bias corrected MLE)	54.08
Theta hat (MLE)	0.895	Theta star (bias corrected MLE)	1.118
nu hat (MLE)	2026	nu star (bias corrected)	1622
MLE Mean (bias corrected)	60.46	MLE Sd (bias corrected)	8.222
		Approximate Chi Square Value (0.05)	1530
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1519

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Gamma Distribution

95% Approximate Gamma UCL	64.12	95% Adjusted Gamma UCL	64.58

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.205	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.835	Mean of logged Data	4.095
Maximum of Logged Data	4.275	SD of logged Data	0.128

Assuming Lognormal Distribution

95% H-UCL	64.28	90% Chebyshev (MVUE) UCL	66.49
95% Chebyshev (MVUE) UCL	69.21	97.5% Chebyshev (MVUE) UCL	72.99
99% Chebyshev (MVUE) UCL	80.42		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	63.61	95% BCA Bootstrap UCL	63.19
95% Standard Bootstrap UCL	63.46	95% Bootstrap-t UCL	63.58
95% Hall's Bootstrap UCL	63.45	95% Percentile Bootstrap UCL	63.5
90% Chebyshev(Mean, Sd) UCL	66.2	95% Chebyshev(Mean, Sd) UCL	68.8
97.5% Chebyshev(Mean, Sd) UCL	72.41	99% Chebyshev(Mean, Sd) UCL	79.49

Suggested UCL to Use

95% Student's-t UCL	63.83

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (molybdenum [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	207	Mean	265
Maximum	324	Median	262
SD	34.08	Std. Error of Mean	8.52
Coefficient of Variation	0.129	Skewness	0.397

Normal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	279.9	95% Adjusted-CLT UCL (Chen-1995)	279.9
		95% Modified-t UCL (Johnson-1978)	280.1

Gamma GOF Test

A-D Test Statistic	0.253	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.127	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	65.44	k star (bias corrected MLE)	53.21
Theta hat (MLE)	4.049	Theta star (bias corrected MLE)	4.98
nu hat (MLE)	2094	nu star (bias corrected)	1703
MLE Mean (bias corrected)	265	MLE Sd (bias corrected)	36.33
		Approximate Chi Square Value (0.05)	1608
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1598

Assuming Gamma Distribution

95% Approximate Gamma UCL	280.6	95% Adjusted Gamma UCL	282.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.124	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.333	Mean of logged Data	5.572
Maximum of Logged Data	5.781	SD of logged Data	0.128

Assuming Lognormal Distribution

95% H-UCL	280.9	90% Chebyshev (MVUE) UCL	290.4
95% Chebyshev (MVUE) UCL	301.9	97.5% Chebyshev (MVUE) UCL	317.9
99% Chebyshev (MVUE) UCL	349.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	279	95% BCA Bootstrap UCL	279.3
95% Standard Bootstrap UCL	278.3	95% Bootstrap-t UCL	281.1
95% Hall's Bootstrap UCL	280.3	95% Percentile Bootstrap UCL	278.5
90% Chebyshev(Mean, Sd) UCL	290.6	95% Chebyshev(Mean, Sd) UCL	302.1
97.5% Chebyshev(Mean, Sd) UCL	318.2	99% Chebyshev(Mean, Sd) UCL	349.8

Suggested UCL to Use

95% Student's-t UCL	279.9

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (molybdenum [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
Number of Detects	15	Number of Non-Detects	1
Number of Distinct Detects	12	Number of Distinct Non-Detects	1
Minimum Detect	2.3	Minimum Non-Detect	5
Maximum Detect	4.6	Maximum Non-Detect	5
Variance Detects	0.411	Percent Non-Detects	6.25%
Mean Detects	3.393	SD Detects	0.641
Median Detects	3.3	CV Detects	0.189
Skewness Detects	0.453	Kurtosis Detects	-0.309
Mean of Logged Detects	1.205	SD of Logged Detects	0.188

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.143	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.393	KM Standard Error of Mean	0.165
90KM SD	0.619	95% KM (BCA) UCL	3.629
95% KM (t) UCL	3.683	95% KM (Percentile Bootstrap) UCL	3.656
95% KM (z) UCL	3.665	95% KM Bootstrap t UCL	3.727
90% KM Chebyshev UCL	3.89	95% KM Chebyshev UCL	4.115
97.5% KM Chebyshev UCL	4.427	99% KM Chebyshev UCL	5.04

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.306	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.134	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.221	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)	30.53	k star (bias corrected MLE)	24.47
Theta hat (MLE)	0.111	Theta star (bias corrected MLE)	0.139
nu hat (MLE)	916	nu star (bias corrected)	734.1
Mean (detects)	3.393		

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	2.3	Mean	3.391

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum	4.6	Median	3.331
SD	0.619	CV	0.183
k hat (MLE)	32.55	k star (bias corrected MLE)	26.49
Theta hat (MLE)	0.104	Theta star (bias corrected MLE)	0.128
nu hat (MLE)	1042	nu star (bias corrected)	847.7
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (847.68, α)	781.1	Adjusted Chi Square Value (847.68, β)	773.8
95% Gamma Approximate UCL	3.68	95% Gamma Adjusted UCL	3.715

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.393	SD (KM)	0.619
Variance (KM)	0.383	SE of Mean (KM)	0.165
k hat (KM)	30.04	k star (KM)	24.45
nu hat (KM)	961.3	nu star (KM)	782.4
theta hat (KM)	0.113	theta star (KM)	0.139
80% gamma percentile (KM)	3.953	90% gamma percentile (KM)	4.297
95% gamma percentile (KM)	4.595	99% gamma percentile (KM)	5.19

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (782.42, α)	718.5	Adjusted Chi Square Value (782.42, β)	711.5
95% KM Approximate Gamma UCL	3.695	95% KM Adjusted Gamma UCL	3.731

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.12	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.39	Mean in Log Scale	1.205
SD in Original Scale	0.619	SD in Log Scale	0.181
95% t UCL (assumes normality of ROS data)	3.661	95% Percentile Bootstrap UCL	3.656
95% BCA Bootstrap UCL	3.656	95% Bootstrap t UCL	3.694
95% H-UCL (Log ROS)	3.69		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.205	KM Geo Mean	3.338
KM SD (logged)	0.181	95% Critical H Value (KM-Log)	1.788
KM Standard Error of Mean (logged)	0.0485	95% H-UCL (KM -Log)	3.69
KM SD (logged)	0.181	95% Critical H Value (KM-Log)	1.788
KM Standard Error of Mean (logged)	0.0485		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.338	Mean in Log Scale	1.187
SD in Original Scale	0.658	SD in Log Scale	0.195
95% t UCL (Assumes normality)	3.626	95% H-Stat UCL	3.658

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% KM (t) UCL	3.683

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (molybdenum [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	13
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	1.5	Maximum Non-Detect	5
Variance Detects	0.0533	Percent Non-Detects	81.25%
Mean Detects	1.233	SD Detects	0.231
Median Detects	1.1	CV Detects	0.187
Skewness Detects	1.732	Kurtosis Detects	N/A
Mean of Logged Detects	0.199	SD of Logged Detects	0.179

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	0.75	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.753	Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.429	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Approximate Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.057	KM Standard Error of Mean	0.0414
90KM SD	0.126	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.129	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.125	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.181	95% KM Chebyshev UCL	1.237
97.5% KM Chebyshev UCL	1.315	99% KM Chebyshev UCL	1.468

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.619	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.634	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.427	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.431	Detected data appear Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	45.52	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0271	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	273.1	nu star (bias corrected)	N/A
Mean (detects)	1.233		

Gamma ROS Statistics using Imputed Non-Detects

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	0.341	Mean	0.789
Maximum	1.5	Median	0.769
SD	0.303	CV	0.385
k hat (MLE)	7.174	k star (bias corrected MLE)	5.871
Theta hat (MLE)	0.11	Theta star (bias corrected MLE)	0.134
nu hat (MLE)	229.6	nu star (bias corrected)	187.9
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (187.87, α)	157.2	Adjusted Chi Square Value (187.87, β)	154
95% Gamma Approximate UCL	0.943	95% Gamma Adjusted UCL	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.057	SD (KM)	0.126
Variance (KM)	0.0158	SE of Mean (KM)	0.0414
k hat (KM)	70.72	k star (KM)	57.5
nu hat (KM)	2263	nu star (KM)	1840
theta hat (KM)	0.0149	theta star (KM)	0.0184
80% gamma percentile (KM)	1.172	90% gamma percentile (KM)	1.239
95% gamma percentile (KM)	1.296	99% gamma percentile (KM)	1.408

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	1741	Adjusted Chi Square Value (N/A, β)	1730
95% KM Approximate Gamma UCL	1.117	95% KM Adjusted Gamma UCL	1.124

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.789	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.389	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.868	Mean in Log Scale	-0.175
SD in Original Scale	0.241	SD in Log Scale	0.261
95% t UCL (assumes normality of ROS data)	0.973	95% Percentile Bootstrap UCL	0.969
95% BCA Bootstrap UCL	0.983	95% Bootstrap t UCL	0.999
95% H-UCL (Log ROS)	0.983		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0493	KM Geo Mean	1.051
KM SD (logged)	0.103	95% Critical H Value (KM-Log)	1.745
KM Standard Error of Mean (logged)	0.0344	95% H-UCL (KM -Log)	1.106
KM SD (logged)	0.103	95% Critical H Value (KM-Log)	1.745
KM Standard Error of Mean (logged)	0.0344		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.856	Mean in Log Scale	-0.273
SD in Original Scale	0.521	SD in Log Scale	0.462

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% t UCL (Assumes normality)	1.084	95% H-Stat UCL	1.077

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 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL 1.129

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (molybdenum [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	4
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	3

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 report_result_value (molybdenum [ug/l]_intrawell_apw-10d) was not processed!

report_result_value (molybdenum [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	13
Number of Distinct Detects	3	Number of Distinct Non-Detects	3
Minimum Detect	1.6	Minimum Non-Detect	1
Maximum Detect	2.1	Maximum Non-Detect	5
Variance Detects	0.07	Percent Non-Detects	81.25%
Mean Detects	1.8	SD Detects	0.265
Median Detects	1.7	CV Detects	0.147
Skewness Detects	1.458	Kurtosis Detects	N/A
Mean of Logged Detects	0.581	SD of Logged Detects	0.143

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	0.893	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.753	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.314	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.429	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.16	KM Standard Error of Mean	0.106
90KM SD	0.334	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.345	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.334	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.477	95% KM Chebyshev UCL	1.621
97.5% KM Chebyshev UCL	1.82	99% KM Chebyshev UCL	2.212

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.385	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.634	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.337	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.431	Detected data appear Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	72.31	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0249	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	433.9	nu star (bias corrected)	N/A
Mean (detects)	1.8		

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	0.794
Maximum	2.1	Median	0.698
SD	0.614	CV	0.773
k hat (MLE)	0.934	k star (bias corrected MLE)	0.801
Theta hat (MLE)	0.85	Theta star (bias corrected MLE)	0.991
nu hat (MLE)	29.9	nu star (bias corrected)	25.63
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (25.63, α)	15.09	Adjusted Chi Square Value (25.63, β)	14.18
95% Gamma Approximate UCL	1.348	95% Gamma Adjusted UCL	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.16	SD (KM)	0.334
Variance (KM)	0.112	SE of Mean (KM)	0.106
k hat (KM)	12.04	k star (KM)	9.827
nu hat (KM)	385.4	nu star (KM)	314.5
theta hat (KM)	0.0963	theta star (KM)	0.118
80% gamma percentile (KM)	1.455	90% gamma percentile (KM)	1.652
95% gamma percentile (KM)	1.828	99% gamma percentile (KM)	2.189

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (314.45, α)	274.4	Adjusted Chi Square Value (314.45, β)	270.1
95% KM Approximate Gamma UCL	1.329	95% KM Adjusted Gamma UCL	1.35

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.907	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.789	Detected Data appear Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lilliefors Test Statistic	0.304	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.389	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.059	Mean in Log Scale	-0.0125
SD in Original Scale	0.429	SD in Log Scale	0.379
95% t UCL (assumes normality of ROS data)	1.247	95% Percentile Bootstrap UCL	1.242
95% BCA Bootstrap UCL	1.26	95% Bootstrap t UCL	1.3
95% H-UCL (Log ROS)	1.282		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.116	KM Geo Mean	1.123
KM SD (logged)	0.238	95% Critical H Value (KM-Log)	1.825
KM Standard Error of Mean (logged)	0.0753	95% H-UCL (KM -Log)	1.293
KM SD (logged)	0.238	95% Critical H Value (KM-Log)	1.825
KM Standard Error of Mean (logged)	0.0753		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.963	Mean in Log Scale	-0.202
SD in Original Scale	0.641	SD in Log Scale	0.555
95% t UCL (Assumes normality)	1.243	95% H-Stat UCL	1.29

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.345

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	4.5	Mean	31.38
Maximum	72.5	Median	27.55
SD	21.84	Std. Error of Mean	6.906
Coefficient of Variation	0.696	Skewness	0.942

Normal GOF Test

Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.781	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.304	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	44.04	95% Adjusted-CLT UCL (Chen-1995)	44.94
		95% Modified-t UCL (Johnson-1978)	44.38

Gamma GOF Test

A-D Test Statistic	0.202	**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	0.143	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.27	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.124	k star (bias corrected MLE)	1.554
Theta hat (MLE)	14.77	Theta star (bias corrected MLE)	20.2
nu hat (MLE)	42.48	nu star (bias corrected)	31.07
MLE Mean (bias corrected)	31.38	MLE Sd (bias corrected)	25.18
		Approximate Chi Square Value (0.05)	19.34
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	17.74

Assuming Gamma Distribution

95% Approximate Gamma UCL	50.42	95% Adjusted Gamma UCL	54.95

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.869	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.138	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.241	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.504	Mean of logged Data	3.193
Maximum of Logged Data	4.284	SD of logged Data	0.814

Assuming Lognormal Distribution

95% H-UCL	71.32	90% Chebyshev (MVUE) UCL	58.7
95% Chebyshev (MVUE) UCL	70.54	97.5% Chebyshev (MVUE) UCL	86.97
99% Chebyshev (MVUE) UCL	119.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	42.74	95% BCA Bootstrap UCL	44.03
95% Standard Bootstrap UCL	42.51	95% Bootstrap-t UCL	51.81
95% Hall's Bootstrap UCL	60.5	95% Percentile Bootstrap UCL	43.15
90% Chebyshev(Mean, Sd) UCL	52.1	95% Chebyshev(Mean, Sd) UCL	61.48
97.5% Chebyshev(Mean, Sd) UCL	74.51	99% Chebyshev(Mean, Sd) UCL	100.1

Suggested UCL to Use

95% Student's-t UCL	44.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
Number of Detects	8	Number of Non-Detects	2
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	1	Minimum Non-Detect	1
Maximum Detect	10	Maximum Non-Detect	1
Variance Detects	8.224	Percent Non-Detects	20%
Mean Detects	3.988	SD Detects	2.868
Median Detects	2.95	CV Detects	0.719
Skewness Detects	1.455	Kurtosis Detects	2.304
Mean of Logged Detects	1.168	SD of Logged Detects	0.711

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.87	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.22	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.39	KM Standard Error of Mean	0.906
90KM SD	2.68	95% KM (BCA) UCL	4.92
95% KM (t) UCL	5.051	95% KM (Percentile Bootstrap) UCL	4.87
95% KM (z) UCL	4.881	95% KM Bootstrap t UCL	6.169
90% KM Chebyshev UCL	6.108	95% KM Chebyshev UCL	7.34
97.5% KM Chebyshev UCL	9.049	99% KM Chebyshev UCL	12.41

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.217	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.159	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	2.478	k star (bias corrected MLE)	1.632
Theta hat (MLE)	1.609	Theta star (bias corrected MLE)	2.443
nu hat (MLE)	39.65	nu star (bias corrected)	26.11
Mean (detects)	3.988		

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	3.192
Maximum	10	Median	2.55

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD	3.035	CV	0.951
k hat (MLE)	0.546	k star (bias corrected MLE)	0.449
Theta hat (MLE)	5.844	Theta star (bias corrected MLE)	7.109
nu hat (MLE)	10.92	nu star (bias corrected)	8.98
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (8.98, α)	3.315	Adjusted Chi Square Value (8.98, β)	2.745
95% Gamma Approximate UCL	8.647	95% Gamma Adjusted UCL	10.44

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.39	SD (KM)	2.68
Variance (KM)	7.185	SE of Mean (KM)	0.906
k hat (KM)	1.599	k star (KM)	1.186
nu hat (KM)	31.99	nu star (KM)	23.73
theta hat (KM)	2.119	theta star (KM)	2.858
80% gamma percentile (KM)	5.374	90% gamma percentile (KM)	7.483
95% gamma percentile (KM)	9.566	99% gamma percentile (KM)	14.34

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.73, α)	13.64	Adjusted Chi Square Value (23.73, β)	12.33
95% KM Approximate Gamma UCL	5.897	95% KM Adjusted Gamma UCL	6.523

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.986	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.851	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.117	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.265	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.304	Mean in Log Scale	0.817
SD in Original Scale	2.911	SD in Log Scale	0.975
95% t UCL (assumes normality of ROS data)	4.992	95% Percentile Bootstrap UCL	4.799
95% BCA Bootstrap UCL	5.205	95% Bootstrap t UCL	5.907
95% H-UCL (Log ROS)	9.808		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.934	KM Geo Mean	2.546
KM SD (logged)	0.756	95% Critical H Value (KM-Log)	2.631
KM Standard Error of Mean (logged)	0.256	95% H-UCL (KM -Log)	6.578
KM SD (logged)	0.756	95% Critical H Value (KM-Log)	2.631
KM Standard Error of Mean (logged)	0.256		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.29	Mean in Log Scale	0.796
SD in Original Scale	2.926	SD in Log Scale	1.004
95% t UCL (Assumes normality)	4.986	95% H-Stat UCL	10.41

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% KM (t) UCL	5.051

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	3
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	1.2	Minimum Non-Detect	1
Maximum Detect	7.4	Maximum Non-Detect	1
Variance Detects	4.418	Percent Non-Detects	30%
Mean Detects	3.286	SD Detects	2.102
Median Detects	2.3	CV Detects	0.64
Skewness Detects	1.431	Kurtosis Detects	2.064
Mean of Logged Detects	1.031	SD of Logged Detects	0.6

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.73	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.252	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.35	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.6	KM Standard Error of Mean	0.661
90KM SD	1.936	95% KM (BCA) UCL	3.7
95% KM (t) UCL	3.812	95% KM (Percentile Bootstrap) UCL	3.75
95% KM (z) UCL	3.688	95% KM Bootstrap t UCL	4.602
90% KM Chebyshev UCL	4.584	95% KM Chebyshev UCL	5.482
97.5% KM Chebyshev UCL	6.73	99% KM Chebyshev UCL	9.179

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.301	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.711	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.236	**Kolmogorov-Smirnov GOF**
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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	3.315	k star (bias corrected MLE)	1.99
Theta hat (MLE)	0.991	Theta star (bias corrected MLE)	1.651
nu hat (MLE)	46.41	nu star (bias corrected)	27.86
Mean (detects)	3.286		

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

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	2.303
Maximum	7.4	Median	2.05
SD	2.334	CV	1.014
k hat (MLE)	0.435	k star (bias corrected MLE)	0.371
Theta hat (MLE)	5.298	Theta star (bias corrected MLE)	6.209
nu hat (MLE)	8.693	nu star (bias corrected)	7.419
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (7.42, α)	2.403	Adjusted Chi Square Value (7.42, β)	1.937
95% Gamma Approximate UCL	7.11	95% Gamma Adjusted UCL	8.818

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.6	SD (KM)	1.936
Variance (KM)	3.748	SE of Mean (KM)	0.661
k hat (KM)	1.804	k star (KM)	1.329
nu hat (KM)	36.07	nu star (KM)	26.58
theta hat (KM)	1.442	theta star (KM)	1.956
80% gamma percentile (KM)	4.075	90% gamma percentile (KM)	5.581
95% gamma percentile (KM)	7.055	99% gamma percentile (KM)	10.41

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (26.58, α)	15.83	Adjusted Chi Square Value (26.58, β)	14.41
95% KM Approximate Gamma UCL	4.366	95% KM Adjusted Gamma UCL	4.798

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.838	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.201	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.28	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.484	Mean in Log Scale	0.563
SD in Original Scale	2.15	SD in Log Scale	0.914
95% t UCL (assumes normality of ROS data)	3.73	95% Percentile Bootstrap UCL	3.59
95% BCA Bootstrap UCL	3.862	95% Bootstrap t UCL	4.434
95% H-UCL (Log ROS)	6.511		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.722	KM Geo Mean	2.058
KM SD (logged)	0.663	95% Critical H Value (KM-Log)	2.469
KM Standard Error of Mean (logged)	0.226	95% H-UCL (KM -Log)	4.423
KM SD (logged)	0.663	95% Critical H Value (KM-Log)	2.469
KM Standard Error of Mean (logged)	0.226		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.45	Mean in Log Scale	0.514
SD in Original Scale	2.181	SD in Log Scale	0.966
95% t UCL (Assumes normality)	3.714	95% H-Stat UCL	7.086

DL/2 is not a recommended method, provided for comparisons and historical reasons

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3.812

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	1.7	Mean	3.189
Maximum	9.3	Median	2.5
SD	2.359	Std. Error of Mean	0.786
Coefficient of Variation	0.74	Skewness	2.685

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.613	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.764	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.387	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.316	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	4.651	95% Adjusted-CLT UCL (Chen-1995)	5.234
		95% Modified-t UCL (Johnson-1978)	4.768

Gamma GOF Test

A-D Test Statistic	0.968	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.726	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.316	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.281	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.529	k star (bias corrected MLE)	2.427
Theta hat (MLE)	0.904	Theta star (bias corrected MLE)	1.314
nu hat (MLE)	63.53	nu star (bias corrected)	43.68
MLE Mean (bias corrected)	3.189	MLE Sd (bias corrected)	2.047
		Approximate Chi Square Value (0.05)	29.53
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	27.09

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Gamma Distribution

95% Approximate Gamma UCL	4.718	95% Adjusted Gamma UCL	5.141

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.272	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.252	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.531	Mean of logged Data	1.011
Maximum of Logged Data	2.23	SD of logged Data	0.513

Assuming Lognormal Distribution

95% H-UCL	4.711	90% Chebyshev (MVUE) UCL	4.691
95% Chebyshev (MVUE) UCL	5.418	97.5% Chebyshev (MVUE) UCL	6.428
99% Chebyshev (MVUE) UCL	8.41		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	4.482	95% BCA Bootstrap UCL	4.978
95% Standard Bootstrap UCL	4.393	95% Bootstrap-t UCL	7.625
95% Hall's Bootstrap UCL	9.519	95% Percentile Bootstrap UCL	4.656
90% Chebyshev(Mean, Sd) UCL	5.548	95% Chebyshev(Mean, Sd) UCL	6.616
97.5% Chebyshev(Mean, Sd) UCL	8.099	99% Chebyshev(Mean, Sd) UCL	11.01

Suggested UCL to Use

Recommendation cannot be provided

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
Number of Detects	9	Number of Non-Detects	1
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	1.2	Minimum Non-Detect	1
Maximum Detect	9	Maximum Non-Detect	1
Variance Detects	5.791	Percent Non-Detects	10%
Mean Detects	2.811	SD Detects	2.406
Median Detects	2.1	CV Detects	0.856
Skewness Detects	2.607	Kurtosis Detects	7.275
Mean of Logged Detects	0.83	SD of Logged Detects	0.609

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.64	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.764	Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.341	**Lilliefors GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1% Lilliefors Critical Value	0.316	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.63	KM Standard Error of Mean	0.745
90KM SD	2.22	95% KM (BCA) UCL	3.99
95% KM (t) UCL	3.995	95% KM (Percentile Bootstrap) UCL	3.94
95% KM (z) UCL	3.855	95% KM Bootstrap t UCL	6.378
90% KM Chebyshev UCL	4.864	95% KM Chebyshev UCL	5.876
97.5% KM Chebyshev UCL	7.28	99% KM Chebyshev UCL	10.04

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.766	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.728	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.246	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.282	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	2.615	k star (bias corrected MLE)	1.818
Theta hat (MLE)	1.075	Theta star (bias corrected MLE)	1.547
nu hat (MLE)	47.07	nu star (bias corrected)	32.72
Mean (detects)	2.811		

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	2.531
Maximum	9	Median	2.1
SD	2.436	CV	0.962
k hat (MLE)	0.91	k star (bias corrected MLE)	0.703
Theta hat (MLE)	2.782	Theta star (bias corrected MLE)	3.598
nu hat (MLE)	18.19	nu star (bias corrected)	14.07
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (14.07, α)	6.619	Adjusted Chi Square Value (14.07, β)	5.754
95% Gamma Approximate UCL	5.38	95% Gamma Adjusted UCL	6.189

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.63	SD (KM)	2.22
Variance (KM)	4.928	SE of Mean (KM)	0.745
k hat (KM)	1.404	k star (KM)	1.049
nu hat (KM)	28.07	nu star (KM)	20.98
theta hat (KM)	1.874	theta star (KM)	2.507
80% gamma percentile (KM)	4.216	90% gamma percentile (KM)	5.985
95% gamma percentile (KM)	7.747	99% gamma percentile (KM)	11.82

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.98, α)	11.58	Adjusted Chi Square Value (20.98, β)	10.38
95% KM Approximate Gamma UCL	4.766	95% KM Adjusted Gamma UCL	5.314

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.252	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.585	Mean in Log Scale	0.688
SD in Original Scale	2.379	SD in Log Scale	0.73
95% t UCL (assumes normality of ROS data)	3.964	95% Percentile Bootstrap UCL	3.93
95% BCA Bootstrap UCL	4.47	95% Bootstrap t UCL	5.866
95% H-UCL (Log ROS)	4.872		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.747	KM Geo Mean	2.111
KM SD (logged)	0.599	95% Critical H Value (KM-Log)	2.367
KM Standard Error of Mean (logged)	0.201	95% H-UCL (KM -Log)	4.054
KM SD (logged)	0.599	95% Critical H Value (KM-Log)	2.367
KM Standard Error of Mean (logged)	0.201		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.58	Mean in Log Scale	0.678
SD in Original Scale	2.384	SD in Log Scale	0.75
95% t UCL (Assumes normality)	3.962	95% H-Stat UCL	5.021

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	5.314	95% GROS Adjusted Gamma UCL	6.189

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	5
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	1.3	Minimum Non-Detect	1
Maximum Detect	15	Maximum Non-Detect	1
Variance Detects	32.54	Percent Non-Detects	50%
Mean Detects	5.04	SD Detects	5.705
Median Detects	3.3	CV Detects	1.132
Skewness Detects	1.979	Kurtosis Detects	4.065

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mean of Logged Detects	1.187	SD of Logged Detects	0.994

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.735	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.686	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.359	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.396	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.02	KM Standard Error of Mean	1.462
90KM SD	4.135	95% KM (BCA) UCL	5.59
95% KM (t) UCL	5.7	95% KM (Percentile Bootstrap) UCL	5.5
95% KM (z) UCL	5.425	95% KM Bootstrap t UCL	9.966
90% KM Chebyshev UCL	7.406	95% KM Chebyshev UCL	9.392
97.5% KM Chebyshev UCL	12.15	99% KM Chebyshev UCL	17.57

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.446	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.688	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.261	**Kolmogorov-Smirnov GOF**	
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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	1.304	k star (bias corrected MLE)	0.655
Theta hat (MLE)	3.866	Theta star (bias corrected MLE)	7.697
nu hat (MLE)	13.04	nu star (bias corrected)	6.548
Mean (detects)	5.04		

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	2.525
Maximum	15	Median	0.655
SD	4.636	CV	1.836
k hat (MLE)	0.267	k star (bias corrected MLE)	0.253
Theta hat (MLE)	9.467	Theta star (bias corrected MLE)	9.965
nu hat (MLE)	5.335	nu star (bias corrected)	5.068
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (5.07, α)	1.183	Adjusted Chi Square Value (5.07, β)	0.893
95% Gamma Approximate UCL	10.81	95% Gamma Adjusted UCL	14.33

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.02	SD (KM)	4.135
Variance (KM)	17.1	SE of Mean (KM)	1.462
k hat (KM)	0.533	k star (KM)	0.44
nu hat (KM)	10.67	nu star (KM)	8.801
theta hat (KM)	5.661	theta star (KM)	6.863

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

80% gamma percentile (KM)	4.92	90% gamma percentile (KM)	8.382
95% gamma percentile (KM)	12.14	99% gamma percentile (KM)	21.49

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.80, α)	3.207	Adjusted Chi Square Value (8.80, β)	2.649
95% KM Approximate Gamma UCL	8.287	95% KM Adjusted Gamma UCL	10.03

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.806	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.204	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.319	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.622	Mean in Log Scale	-0.363
SD in Original Scale	4.579	SD in Log Scale	1.878
95% t UCL (assumes normality of ROS data)	5.277	95% Percentile Bootstrap UCL	5.21
95% BCA Bootstrap UCL	6.535	95% Bootstrap t UCL	10.59
95% H-UCL (Log ROS)	98.98		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.594	KM Geo Mean	1.81
KM SD (logged)	0.865	95% Critical H Value (KM-Log)	2.833
KM Standard Error of Mean (logged)	0.306	95% H-UCL (KM -Log)	5.953
KM SD (logged)	0.865	95% Critical H Value (KM-Log)	2.833
KM Standard Error of Mean (logged)	0.306		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.77	Mean in Log Scale	0.247
SD in Original Scale	4.493	SD in Log Scale	1.192
95% t UCL (Assumes normality)	5.375	95% H-Stat UCL	10.52

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	5.7

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-08)

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	2.6	Mean	4.09
Maximum	7.7	Median	3.4
SD	1.804	Std. Error of Mean	0.57
Coefficient of Variation	0.441	Skewness	1.05

Normal GOF Test

Shapiro Wilk Test Statistic	0.836	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.781	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.245	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.304	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5.136	95% Adjusted-CLT UCL (Chen-1995)	5.231
		95% Modified-t UCL (Johnson-1978)	5.167

Gamma GOF Test

A-D Test Statistic	0.664	**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	0.256	**Kolmogorov-Smirnov Gamma GOF Test**
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

k hat (MLE)	6.498	k star (bias corrected MLE)	4.615
Theta hat (MLE)	0.629	Theta star (bias corrected MLE)	0.886
nu hat (MLE)	130	nu star (bias corrected)	92.3
MLE Mean (bias corrected)	4.09	MLE Sd (bias corrected)	1.904
		Approximate Chi Square Value (0.05)	71.15
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	67.93

Assuming Gamma Distribution

95% Approximate Gamma UCL	5.306	95% Adjusted Gamma UCL	5.558

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.869	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.241	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.956	Mean of logged Data	1.33
Maximum of Logged Data	2.041	SD of logged Data	0.408

Assuming Lognormal Distribution

95% H-UCL	5.466	90% Chebyshev (MVUE) UCL	5.668
95% Chebyshev (MVUE) UCL	6.391	97.5% Chebyshev (MVUE) UCL	7.395
99% Chebyshev (MVUE) UCL	9.366		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	5.028	95% BCA Bootstrap UCL	5.13
95% Standard Bootstrap UCL	4.991	95% Bootstrap-t UCL	5.636
95% Hall's Bootstrap UCL	5.303	95% Percentile Bootstrap UCL	5.01
90% Chebyshev(Mean, Sd) UCL	5.801	95% Chebyshev(Mean, Sd) UCL	6.577
97.5% Chebyshev(Mean, Sd) UCL	7.653	99% Chebyshev(Mean, Sd) UCL	9.766

Suggested UCL to Use

95% Student's-t UCL	5.136

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (nickel [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	2.5	Mean	6.12
Maximum	9.5	Median	6.4
SD	2.024	Std. Error of Mean	0.64
Coefficient of Variation	0.331	Skewness	-0.36

Normal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.781	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.143	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.304	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.293	95% Adjusted-CLT UCL (Chen-1995)	7.095
		95% Modified-t UCL (Johnson-1978)	7.281

Gamma GOF Test

A-D Test Statistic	0.428	**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	0.187	**Kolmogorov-Smirnov Gamma GOF Test**
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

k hat (MLE)	8.313	k star (bias corrected MLE)	5.885
Theta hat (MLE)	0.736	Theta star (bias corrected MLE)	1.04
nu hat (MLE)	166.3	nu star (bias corrected)	117.7
MLE Mean (bias corrected)	6.12	MLE Sd (bias corrected)	2.523
		Approximate Chi Square Value (0.05)	93.66
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	89.94

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.692	95% Adjusted Gamma UCL	8.01

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.869	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.217	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.241	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.916	Mean of logged Data	1.75
Maximum of Logged Data	2.251	SD of logged Data	0.394

Assuming Lognormal Distribution

95% H-UCL	8.176	90% Chebyshev (MVUE) UCL	8.502
95% Chebyshev (MVUE) UCL	9.559	97.5% Chebyshev (MVUE) UCL	11.03
99% Chebyshev (MVUE) UCL	13.91		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.173	95% BCA Bootstrap UCL	7.1
95% Standard Bootstrap UCL	7.127	95% Bootstrap-t UCL	7.216
95% Hall's Bootstrap UCL	7.207	95% Percentile Bootstrap UCL	7.12
90% Chebyshev(Mean, Sd) UCL	8.04	95% Chebyshev(Mean, Sd) UCL	8.909
97.5% Chebyshev(Mean, Sd) UCL	10.12	99% Chebyshev(Mean, Sd) UCL	12.49

Suggested UCL to Use

95% Student's-t UCL	7.293

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (nickel [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	6
Number of Detects	6	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	1.2	Minimum Non-Detect	1
Maximum Detect	5.1	Maximum Non-Detect	1
Variance Detects	2.39	Percent Non-Detects	40%
Mean Detects	2.283	SD Detects	1.546
Median Detects	1.45	CV Detects	0.677
Skewness Detects	1.605	Kurtosis Detects	1.884
Mean of Logged Detects	0.67	SD of Logged Detects	0.577

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.75	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.713	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.373	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.77	KM Standard Error of Mean	0.437
90KM SD	1.261	95% KM (BCA) UCL	2.52
95% KM (t) UCL	2.571	95% KM (Percentile Bootstrap) UCL	2.52
95% KM (z) UCL	2.489	95% KM Bootstrap t UCL	5.313
90% KM Chebyshev UCL	3.08	95% KM Chebyshev UCL	3.674
97.5% KM Chebyshev UCL	4.498	99% KM Chebyshev UCL	6.116

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.74	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.701	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.37	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.334	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)	3.375	k star (bias corrected MLE)	1.799
Theta hat (MLE)	0.677	Theta star (bias corrected MLE)	1.27
nu hat (MLE)	40.5	nu star (bias corrected)	21.58
Mean (detects)	2.283		

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	1.374
Maximum	5.1	Median	1.3
SD	1.645	CV	1.197
k hat (MLE)	0.378	k star (bias corrected MLE)	0.331
Theta hat (MLE)	3.636	Theta star (bias corrected MLE)	4.149
nu hat (MLE)	7.557	nu star (bias corrected)	6.623
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (6.62, α)	1.966	Adjusted Chi Square Value (6.62, β)	1.557
95% Gamma Approximate UCL	4.628	95% Gamma Adjusted UCL	5.845

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.77	SD (KM)	1.261
Variance (KM)	1.59	SE of Mean (KM)	0.437
k hat (KM)	1.97	k star (KM)	1.446
nu hat (KM)	39.41	nu star (KM)	28.92
theta hat (KM)	0.898	theta star (KM)	1.224
80% gamma percentile (KM)	2.75	90% gamma percentile (KM)	3.722
95% gamma percentile (KM)	4.668	99% gamma percentile (KM)	6.81

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.92, α)	17.64	Adjusted Chi Square Value (28.92, β)	16.13
95% KM Approximate Gamma UCL	2.901	95% KM Adjusted Gamma UCL	3.173

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.826	Detected Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.344	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.298	Detected Data Not Lognormal at 10% Significance Level	

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.546	Mean in Log Scale	0.0484
SD in Original Scale	1.498	SD in Log Scale	0.943
95% t UCL (assumes normality of ROS data)	2.414	95% Percentile Bootstrap UCL	2.305
95% BCA Bootstrap UCL	2.57	95% Bootstrap t UCL	3.433
95% H-UCL (Log ROS)	4.187		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.402	KM Geo Mean	1.495
KM SD (logged)	0.524	95% Critical H Value (KM-Log)	2.253
KM Standard Error of Mean (logged)	0.181	95% H-UCL (KM -Log)	2.541
KM SD (logged)	0.524	95% Critical H Value (KM-Log)	2.253
KM Standard Error of Mean (logged)	0.181		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.57	Mean in Log Scale	0.125
SD in Original Scale	1.475	SD in Log Scale	0.825
95% t UCL (Assumes normality)	2.425	95% H-Stat UCL	3.398

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	2.571

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	6.9	Mean	7.106
Maximum	7.52	Median	7.075
SD	0.148	Std. Error of Mean	0.0371
Coefficient of Variation	0.0209	Skewness	1.549

Normal GOF Test

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.197	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.171	95% Adjusted-CLT UCL (Chen-1995)	7.183
		95% Modified-t UCL (Johnson-1978)	7.174

Gamma GOF Test

A-D Test Statistic	0.742	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.19	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	2489	k star (bias corrected MLE)	2022
Theta hat (MLE)	0.00286	Theta star (bias corrected MLE)	0.00351
nu hat (MLE)	79643	nu star (bias corrected)	64712
MLE Mean (bias corrected)	7.106	MLE Sd (bias corrected)	0.158
		Approximate Chi Square Value (0.05)	64121
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	64054

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.172	95% Adjusted Gamma UCL	7.179

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.192	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.932	Mean of logged Data	1.961
Maximum of Logged Data	2.018	SD of logged Data	0.0206

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.216
95% Chebyshev (MVUE) UCL	7.266	97.5% Chebyshev (MVUE) UCL	7.335
99% Chebyshev (MVUE) UCL	7.471		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.167	95% BCA Bootstrap UCL	7.179
95% Standard Bootstrap UCL	7.165	95% Bootstrap-t UCL	7.208
95% Hall's Bootstrap UCL	7.535	95% Percentile Bootstrap UCL	7.166
90% Chebyshev(Mean, Sd) UCL	7.218	95% Chebyshev(Mean, Sd) UCL	7.268
97.5% Chebyshev(Mean, Sd) UCL	7.338	99% Chebyshev(Mean, Sd) UCL	7.476

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Suggested UCL to Use

95% Student's-t UCL 7.171

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	7.21	Mean	7.573
Maximum	7.93	Median	7.49
SD	0.243	Std. Error of Mean	0.0606
Coefficient of Variation	0.032	Skewness	0.0346

Normal GOF Test

Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.679	95% Adjusted-CLT UCL (Chen-1995)	7.673
		95% Modified-t UCL (Johnson-1978)	7.679

Gamma GOF Test

A-D Test Statistic	0.579	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.181	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1040	k star (bias corrected MLE)	844.8
Theta hat (MLE)	0.00728	Theta star (bias corrected MLE)	0.00896
nu hat (MLE)	33269	nu star (bias corrected)	27032
MLE Mean (bias corrected)	7.573	MLE Sd (bias corrected)	0.261
		Approximate Chi Square Value (0.05)	26651
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	26608

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.681	95% Adjusted Gamma UCL	7.693

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.175	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.975	Mean of logged Data	2.024
Maximum of Logged Data	2.071	SD of logged Data	0.032

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.754
95% Chebyshev (MVUE) UCL	7.837	97.5% Chebyshev (MVUE) UCL	7.951
99% Chebyshev (MVUE) UCL	8.176		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.672	95% BCA Bootstrap UCL	7.674
95% Standard Bootstrap UCL	7.668	95% Bootstrap-t UCL	7.678
95% Hall's Bootstrap UCL	7.666	95% Percentile Bootstrap UCL	7.669
90% Chebyshev(Mean, Sd) UCL	7.754	95% Chebyshev(Mean, Sd) UCL	7.837
97.5% Chebyshev(Mean, Sd) UCL	7.951	99% Chebyshev(Mean, Sd) UCL	8.176

Suggested UCL to Use

95% Student's-t UCL	7.679

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	7.18	Mean	7.315
Maximum	7.55	Median	7.305
SD	0.0866	Std. Error of Mean	0.0216
Coefficient of Variation	0.0118	Skewness	1.235

Normal GOF Test

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.148	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.353	95% Adjusted-CLT UCL (Chen-1995)	7.358
		95% Modified-t UCL (Johnson-1978)	7.354

Gamma GOF Test

A-D Test Statistic	0.799	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

K-S Test Statistic	0.261	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7680	k star (bias corrected MLE)	6240
Theta hat (MLE)	9.5243E-4	Theta star (bias corrected MLE)	0.00117
nu hat (MLE)	245771	nu star (bias corrected)	199690
MLE Mean (bias corrected)	7.315	MLE Sd (bias corrected)	0.0926
		Approximate Chi Square Value (0.05)	198652
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	198534

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.353	95% Adjusted Gamma UCL	7.358

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.146	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.971	Mean of logged Data	1.99
Maximum of Logged Data	2.022	SD of logged Data	0.0118

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.38
95% Chebyshev (MVUE) UCL	7.409	97.5% Chebyshev (MVUE) UCL	7.449
99% Chebyshev (MVUE) UCL	7.529		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.351	95% BCA Bootstrap UCL	7.356
95% Standard Bootstrap UCL	7.349	95% Bootstrap-t UCL	7.365
95% Hall's Bootstrap UCL	7.385	95% Percentile Bootstrap UCL	7.349
90% Chebyshev(Mean, Sd) UCL	7.38	95% Chebyshev(Mean, Sd) UCL	7.409
97.5% Chebyshev(Mean, Sd) UCL	7.45	99% Chebyshev(Mean, Sd) UCL	7.53

Suggested UCL to Use

95% Student's-t UCL	7.353

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	12
		Number of Missing Observations	0

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Minimum	7.19	Mean	7.295
Maximum	7.73	Median	7.23
SD	0.141	Std. Error of Mean	0.0364
Coefficient of Variation	0.0193	Skewness	2.358

Normal GOF Test

Shapiro Wilk Test Statistic	0.715	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.359	95% Adjusted-CLT UCL (Chen-1995)	7.379
		95% Modified-t UCL (Johnson-1978)	7.363

Gamma GOF Test

A-D Test Statistic	1.511	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.245	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2948	k star (bias corrected MLE)	2359
Theta hat (MLE)	0.00247	Theta star (bias corrected MLE)	0.00309
nu hat (MLE)	88448	nu star (bias corrected)	70760
MLE Mean (bias corrected)	7.295	MLE Sd (bias corrected)	0.15
		Approximate Chi Square Value (0.05)	70142
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	70066

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.36	95% Adjusted Gamma UCL	7.368

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.723	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.973	Mean of logged Data	1.987
Maximum of Logged Data	2.045	SD of logged Data	0.0189

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.402
95% Chebyshev (MVUE) UCL	7.451	97.5% Chebyshev (MVUE) UCL	7.518
99% Chebyshev (MVUE) UCL	7.65		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nonparametric Distribution Free UCLs

95% CLT UCL	7.355	95% BCA Bootstrap UCL	7.382
95% Standard Bootstrap UCL	7.353	95% Bootstrap-t UCL	7.408
95% Hall's Bootstrap UCL	7.579	95% Percentile Bootstrap UCL	7.357
90% Chebyshev(Mean, Sd) UCL	7.404	95% Chebyshev(Mean, Sd) UCL	7.454
97.5% Chebyshev(Mean, Sd) UCL	7.522	99% Chebyshev(Mean, Sd) UCL	7.657

Suggested UCL to Use

95% Student's-t UCL	7.359

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	7.02	Mean	7.174
Maximum	7.67	Median	7.125
SD	0.161	Std. Error of Mean	0.0403
Coefficient of Variation	0.0225	Skewness	2.182

Normal GOF Test

Shapiro Wilk Test Statistic	0.778	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.217	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.245	95% Adjusted-CLT UCL (Chen-1995)	7.264
		95% Modified-t UCL (Johnson-1978)	7.249

Gamma GOF Test

A-D Test Statistic	1.123	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.208	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	2174	k star (bias corrected MLE)	1766
Theta hat (MLE)	0.0033	Theta star (bias corrected MLE)	0.00406
nu hat (MLE)	69567	nu star (bias corrected)	56525
MLE Mean (bias corrected)	7.174	MLE Sd (bias corrected)	0.171
		Approximate Chi Square Value (0.05)	55973
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	55911

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.245	95% Adjusted Gamma UCL	7.253

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.788	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.211	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.949	Mean of logged Data	1.97
Maximum of Logged Data	2.037	SD of logged Data	0.022

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.293
95% Chebyshev (MVUE) UCL	7.346	97.5% Chebyshev (MVUE) UCL	7.421
99% Chebyshev (MVUE) UCL	7.567		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.241	95% BCA Bootstrap UCL	7.263
95% Standard Bootstrap UCL	7.238	95% Bootstrap-t UCL	7.307
95% Hall's Bootstrap UCL	7.582	95% Percentile Bootstrap UCL	7.242
90% Chebyshev(Mean, Sd) UCL	7.295	95% Chebyshev(Mean, Sd) UCL	7.35
97.5% Chebyshev(Mean, Sd) UCL	7.426	99% Chebyshev(Mean, Sd) UCL	7.575

Suggested UCL to Use

95% Student's-t UCL	7.245

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	6.78	Mean	6.929
Maximum	7.31	Median	6.875
SD	0.149	Std. Error of Mean	0.0372
Coefficient of Variation	0.0215	Skewness	1.719

Normal GOF Test

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6.994	95% Adjusted-CLT UCL (Chen-1995)	7.007
		95% Modified-t UCL (Johnson-1978)	6.997

Gamma GOF Test

A-D Test Statistic	1.322	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.265	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2364	k star (bias corrected MLE)	1921
Theta hat (MLE)	0.00293	Theta star (bias corrected MLE)	0.00361
nu hat (MLE)	75649	nu star (bias corrected)	61466
MLE Mean (bias corrected)	6.929	MLE Sd (bias corrected)	0.158
		Approximate Chi Square Value (0.05)	60891
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	60826

Assuming Gamma Distribution

95% Approximate Gamma UCL	6.994	95% Adjusted Gamma UCL	7.002

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.799	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.252	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.914	Mean of logged Data	1.935
Maximum of Logged Data	1.989	SD of logged Data	0.0211

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.039
95% Chebyshev (MVUE) UCL	7.088	97.5% Chebyshev (MVUE) UCL	7.157
99% Chebyshev (MVUE) UCL	7.293		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	6.99	95% BCA Bootstrap UCL	7.008
95% Standard Bootstrap UCL	6.988	95% Bootstrap-t UCL	7.053
95% Hall's Bootstrap UCL	7.337	95% Percentile Bootstrap UCL	6.991
90% Chebyshev(Mean, Sd) UCL	7.04	95% Chebyshev(Mean, Sd) UCL	7.091
97.5% Chebyshev(Mean, Sd) UCL	7.161	99% Chebyshev(Mean, Sd) UCL	7.299

Suggested UCL to Use

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Student's-t UCL 6.994

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	7	Mean	7.208
Maximum	7.68	Median	7.17
SD	0.181	Std. Error of Mean	0.0454
Coefficient of Variation	0.0252	Skewness	1.263

Normal GOF Test

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.126	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.288	95% Adjusted-CLT UCL (Chen-1995)	7.298
		95% Modified-t UCL (Johnson-1978)	7.29

Gamma GOF Test

A-D Test Statistic	0.532	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.131	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1713	k star (bias corrected MLE)	1392
Theta hat (MLE)	0.00421	Theta star (bias corrected MLE)	0.00518
nu hat (MLE)	54807	nu star (bias corrected)	44532
MLE Mean (bias corrected)	7.208	MLE Sd (bias corrected)	0.193
		Approximate Chi Square Value (0.05)	44042
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	43987

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.288	95% Adjusted Gamma UCL	7.297

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal Statistics

Minimum of Logged Data	1.946	Mean of logged Data	1.975
Maximum of Logged Data	2.039	SD of logged Data	0.0248

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.342
95% Chebyshev (MVUE) UCL	7.403	97.5% Chebyshev (MVUE) UCL	7.488
99% Chebyshev (MVUE) UCL	7.654		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.283	95% BCA Bootstrap UCL	7.296
95% Standard Bootstrap UCL	7.28	95% Bootstrap-t UCL	7.315
95% Hall's Bootstrap UCL	7.341	95% Percentile Bootstrap UCL	7.283
90% Chebyshev(Mean, Sd) UCL	7.344	95% Chebyshev(Mean, Sd) UCL	7.406
97.5% Chebyshev(Mean, Sd) UCL	7.491	99% Chebyshev(Mean, Sd) UCL	7.66

Suggested UCL to Use

95% Student's-t UCL	7.288

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	6.98	Mean	7.173
Maximum	7.66	Median	7.115
SD	0.191	Std. Error of Mean	0.0477
Coefficient of Variation	0.0266	Skewness	1.765

Normal GOF Test

Shapiro Wilk Test Statistic	0.781	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.257	95% Adjusted-CLT UCL (Chen-1995)	7.274
		95% Modified-t UCL (Johnson-1978)	7.26

Gamma GOF Test

A-D Test Statistic	1.363	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.239	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1549	k star (bias corrected MLE)	1258
Theta hat (MLE)	0.00463	Theta star (bias corrected MLE)	0.0057
nu hat (MLE)	49564	nu star (bias corrected)	40272
MLE Mean (bias corrected)	7.173	MLE Sd (bias corrected)	0.202
		Approximate Chi Square Value (0.05)	39806
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	39753

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.257	95% Adjusted Gamma UCL	7.267

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.79	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.232	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.943	Mean of logged Data	1.97
Maximum of Logged Data	2.036	SD of logged Data	0.0261

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.313
95% Chebyshev (MVUE) UCL	7.377	97.5% Chebyshev (MVUE) UCL	7.465
99% Chebyshev (MVUE) UCL	7.638		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	7.252	95% BCA Bootstrap UCL	7.274
95% Standard Bootstrap UCL	7.25	95% Bootstrap-t UCL	7.348
95% Hall's Bootstrap UCL	7.697	95% Percentile Bootstrap UCL	7.255
90% Chebyshev(Mean, Sd) UCL	7.316	95% Chebyshev(Mean, Sd) UCL	7.381
97.5% Chebyshev(Mean, Sd) UCL	7.471	99% Chebyshev(Mean, Sd) UCL	7.648

Suggested UCL to Use

95% Student's-t UCL	7.257

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (ph, lab [su]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	12

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

		Number of Missing Observations	0
Minimum	6.91	Mean	7.063
Maximum	7.58	Median	7
SD	0.165	Std. Error of Mean	0.0413
Coefficient of Variation	0.0234	Skewness	2.264

Normal GOF Test

Shapiro Wilk Test Statistic	0.744	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.251	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	7.136	95% Adjusted-CLT UCL (Chen-1995)	7.156
		95% Modified-t UCL (Johnson-1978)	7.139

Gamma GOF Test

A-D Test Statistic	1.389	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.259	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2006	k star (bias corrected MLE)	1630
Theta hat (MLE)	0.00352	Theta star (bias corrected MLE)	0.00433
nu hat (MLE)	64187	nu star (bias corrected)	52153
MLE Mean (bias corrected)	7.063	MLE Sd (bias corrected)	0.175
		Approximate Chi Square Value (0.05)	51623
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	51563

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.136	95% Adjusted Gamma UCL	7.144

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.755	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.25	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.933	Mean of logged Data	1.955
Maximum of Logged Data	2.026	SD of logged Data	0.0229

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.184
95% Chebyshev (MVUE) UCL	7.239	97.5% Chebyshev (MVUE) UCL	7.316
99% Chebyshev (MVUE) UCL	7.465		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nonparametric Distribution Free UCLs

95% CLT UCL	7.131	95% BCA Bootstrap UCL	7.158
95% Standard Bootstrap UCL	7.129	95% Bootstrap-t UCL	7.196
95% Hall's Bootstrap UCL	7.395	95% Percentile Bootstrap UCL	7.133
90% Chebyshev(Mean, Sd) UCL	7.187	95% Chebyshev(Mean, Sd) UCL	7.243
97.5% Chebyshev(Mean, Sd) UCL	7.321	99% Chebyshev(Mean, Sd) UCL	7.474

Suggested UCL to Use

95% Student's-t UCL	7.136

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.476	Mean	1.967
Maximum	4.09	Median	2
SD	0.862	Std. Error of Mean	0.223
Coefficient of Variation	0.438	Skewness	0.64

Normal GOF Test

Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.359	95% Adjusted-CLT UCL (Chen-1995)	2.373
		95% Modified-t UCL (Johnson-1978)	2.365

Gamma GOF Test

A-D Test Statistic	1.221	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.309	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.222	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.69	k star (bias corrected MLE)	3.797
Theta hat (MLE)	0.419	Theta star (bias corrected MLE)	0.518
nu hat (MLE)	140.7	nu star (bias corrected)	113.9
MLE Mean (bias corrected)	1.967	MLE Sd (bias corrected)	1.01
		Approximate Chi Square Value (0.05)	90.27
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	87.68

Assuming Gamma Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Approximate Gamma UCL	2.482	95% Adjusted Gamma UCL	2.556

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.824	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.328	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.742	Mean of logged Data	0.566
Maximum of Logged Data	1.409	SD of logged Data	0.531

Assuming Lognormal Distribution

95% H-UCL	2.735	90% Chebyshev (MVUE) UCL	2.862
95% Chebyshev (MVUE) UCL	3.249	97.5% Chebyshev (MVUE) UCL	3.786
99% Chebyshev (MVUE) UCL	4.84		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.333	95% BCA Bootstrap UCL	2.342
95% Standard Bootstrap UCL	2.31	95% Bootstrap-t UCL	2.397
95% Hall's Bootstrap UCL	2.567	95% Percentile Bootstrap UCL	2.319
90% Chebyshev(Mean, Sd) UCL	2.635	95% Chebyshev(Mean, Sd) UCL	2.938
97.5% Chebyshev(Mean, Sd) UCL	3.358	99% Chebyshev(Mean, Sd) UCL	4.182

Suggested UCL to Use

95% Student's-t UCL	2.359

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	0.776	Mean	2
Maximum	3.18	Median	2
SD	0.492	Std. Error of Mean	0.123
Coefficient of Variation	0.246	Skewness	-0.155

Normal GOF Test

Shapiro Wilk Test Statistic	0.737	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.375	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	2.215	95% Adjusted-CLT UCL (Chen-1995)	2.197
		95% Modified-t UCL (Johnson-1978)	2.215

Gamma GOF Test

A-D Test Statistic	2.509	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.738	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.41	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.43	k star (bias corrected MLE)	11.77
Theta hat (MLE)	0.139	Theta star (bias corrected MLE)	0.17
nu hat (MLE)	461.8	nu star (bias corrected)	376.6
MLE Mean (bias corrected)	2	MLE Sd (bias corrected)	0.583
		Approximate Chi Square Value (0.05)	332.6
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	327.9

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.264	95% Adjusted Gamma UCL	2.297

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.668	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.423	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.254	Mean of logged Data	0.658
Maximum of Logged Data	1.157	SD of logged Data	0.295

Assuming Lognormal Distribution

95% H-UCL	2.324	90% Chebyshev (MVUE) UCL	2.46
95% Chebyshev (MVUE) UCL	2.664	97.5% Chebyshev (MVUE) UCL	2.946
99% Chebyshev (MVUE) UCL	3.501		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.202	95% BCA Bootstrap UCL	2.183
95% Standard Bootstrap UCL	2.198	95% Bootstrap-t UCL	2.214
95% Hall's Bootstrap UCL	2.279	95% Percentile Bootstrap UCL	2.187
90% Chebyshev(Mean, Sd) UCL	2.369	95% Chebyshev(Mean, Sd) UCL	2.536
97.5% Chebyshev(Mean, Sd) UCL	2.768	99% Chebyshev(Mean, Sd) UCL	3.224

Suggested UCL to Use

95% Student's-t UCL	2.215

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	0.798	Mean	2.282
Maximum	6.34	Median	2
SD	1.278	Std. Error of Mean	0.33
Coefficient of Variation	0.56	Skewness	2.627

Normal GOF Test

Shapiro Wilk Test Statistic	0.599	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.454	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.863	95% Adjusted-CLT UCL (Chen-1995)	3.064
		95% Modified-t UCL (Johnson-1978)	2.901

Gamma GOF Test

A-D Test Statistic	2.319	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.423	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.222	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.095	k star (bias corrected MLE)	4.121
Theta hat (MLE)	0.448	Theta star (bias corrected MLE)	0.554
nu hat (MLE)	152.9	nu star (bias corrected)	123.6
MLE Mean (bias corrected)	2.282	MLE Sd (bias corrected)	1.124
		Approximate Chi Square Value (0.05)	98.95
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	96.23

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.851	95% Adjusted Gamma UCL	2.931

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.744	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.394	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lognormal Statistics

Minimum of Logged Data	-0.226	Mean of logged Data	0.724
Maximum of Logged Data	1.847	SD of logged Data	0.439

Assuming Lognormal Distribution

95% H-UCL	2.874	90% Chebyshev (MVUE) UCL	3.041
95% Chebyshev (MVUE) UCL	3.397	97.5% Chebyshev (MVUE) UCL	3.89
99% Chebyshev (MVUE) UCL	4.861		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.825	95% BCA Bootstrap UCL	3.141
95% Standard Bootstrap UCL	2.806	95% Bootstrap-t UCL	3.955
95% Hall's Bootstrap UCL	6.71	95% Percentile Bootstrap UCL	2.836
90% Chebyshev(Mean, Sd) UCL	3.272	95% Chebyshev(Mean, Sd) UCL	3.721
97.5% Chebyshev(Mean, Sd) UCL	4.343	99% Chebyshev(Mean, Sd) UCL	5.566

Suggested UCL to Use

95% Student's-t UCL	2.863

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	1.38	Mean	1.985
Maximum	2.8	Median	2
SD	0.281	Std. Error of Mean	0.0726
Coefficient of Variation	0.142	Skewness	1.138

Normal GOF Test

Shapiro Wilk Test Statistic	0.657	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.412	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.112	95% Adjusted-CLT UCL (Chen-1995)	2.127
		95% Modified-t UCL (Johnson-1978)	2.116

Gamma GOF Test

A-D Test Statistic	2.542	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.393	**Kolmogorov-Smirnov Gamma GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	55.47	k star (bias corrected MLE)	44.42
Theta hat (MLE)	0.0358	Theta star (bias corrected MLE)	0.0447
nu hat (MLE)	1664	nu star (bias corrected)	1332
MLE Mean (bias corrected)	1.985	MLE Sd (bias corrected)	0.298
		Approximate Chi Square Value (0.05)	1249
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1239

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.118	95% Adjusted Gamma UCL	2.135

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.678	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.385	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.322	Mean of logged Data	0.676
Maximum of Logged Data	1.03	SD of logged Data	0.139

Assuming Lognormal Distribution

95% H-UCL	2.121	90% Chebyshev (MVUE) UCL	2.199
95% Chebyshev (MVUE) UCL	2.296	97.5% Chebyshev (MVUE) UCL	2.431
99% Chebyshev (MVUE) UCL	2.695		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.104	95% BCA Bootstrap UCL	2.121
95% Standard Bootstrap UCL	2.099	95% Bootstrap-t UCL	2.126
95% Hall's Bootstrap UCL	2.282	95% Percentile Bootstrap UCL	2.107
90% Chebyshev(Mean, Sd) UCL	2.202	95% Chebyshev(Mean, Sd) UCL	2.301
97.5% Chebyshev(Mean, Sd) UCL	2.438	99% Chebyshev(Mean, Sd) UCL	2.707

Suggested UCL to Use

95% Student's-t UCL	2.112

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	0.497	Mean	1.869

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Maximum	2.93	Median	2
SD	0.516	Std. Error of Mean	0.129
Coefficient of Variation	0.276	Skewness	-1.069

Normal GOF Test

Shapiro Wilk Test Statistic	0.709	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.095	95% Adjusted-CLT UCL (Chen-1995)	2.044
		95% Modified-t UCL (Johnson-1978)	2.089

Gamma GOF Test

A-D Test Statistic	2.826	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.395	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.134	k star (bias corrected MLE)	7.463
Theta hat (MLE)	0.205	Theta star (bias corrected MLE)	0.25
nu hat (MLE)	292.3	nu star (bias corrected)	238.8
MLE Mean (bias corrected)	1.869	MLE Sd (bias corrected)	0.684
		Approximate Chi Square Value (0.05)	204
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	200.4

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.187	95% Adjusted Gamma UCL	2.227

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.606	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.401	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.699	Mean of logged Data	0.569
Maximum of Logged Data	1.075	SD of logged Data	0.394

Assuming Lognormal Distribution

95% H-UCL	2.328	90% Chebyshev (MVUE) UCL	2.473
95% Chebyshev (MVUE) UCL	2.732	97.5% Chebyshev (MVUE) UCL	3.092
99% Chebyshev (MVUE) UCL	3.799		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% CLT UCL	2.081	95% BCA Bootstrap UCL	2.021
95% Standard Bootstrap UCL	2.07	95% Bootstrap-t UCL	2.056
95% Hall's Bootstrap UCL	2.058	95% Percentile Bootstrap UCL	2.054
90% Chebyshev(Mean, Sd) UCL	2.256	95% Chebyshev(Mean, Sd) UCL	2.431
97.5% Chebyshev(Mean, Sd) UCL	2.675	99% Chebyshev(Mean, Sd) UCL	3.153

Suggested UCL to Use

95% Student's-t UCL	2.095

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	1.1	Mean	1.949
Maximum	2.7	Median	2
SD	0.344	Std. Error of Mean	0.086
Coefficient of Variation	0.176	Skewness	-0.884

Normal GOF Test

Shapiro Wilk Test Statistic	0.652	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.434	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.1	95% Adjusted-CLT UCL (Chen-1995)	2.07
		95% Modified-t UCL (Johnson-1978)	2.097

Gamma GOF Test

A-D Test Statistic	3.26	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.454	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	29.02	k star (bias corrected MLE)	23.62
Theta hat (MLE)	0.0672	Theta star (bias corrected MLE)	0.0825
nu hat (MLE)	928.7	nu star (bias corrected)	755.9
MLE Mean (bias corrected)	1.949	MLE Sd (bias corrected)	0.401
		Approximate Chi Square Value (0.05)	693.1
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	686.3

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.126	95% Adjusted Gamma UCL	2.147

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.616	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.459	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.0953	Mean of logged Data	0.65
Maximum of Logged Data	0.993	SD of logged Data	0.202

Assuming Lognormal Distribution

95% H-UCL	2.148	90% Chebyshev (MVUE) UCL	2.251
95% Chebyshev (MVUE) UCL	2.385	97.5% Chebyshev (MVUE) UCL	2.572
99% Chebyshev (MVUE) UCL	2.94		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.091	95% BCA Bootstrap UCL	2.056
95% Standard Bootstrap UCL	2.088	95% Bootstrap-t UCL	2.084
95% Hall's Bootstrap UCL	2.092	95% Percentile Bootstrap UCL	2.087
90% Chebyshev(Mean, Sd) UCL	2.207	95% Chebyshev(Mean, Sd) UCL	2.324
97.5% Chebyshev(Mean, Sd) UCL	2.486	99% Chebyshev(Mean, Sd) UCL	2.805

Suggested UCL to Use

95% Student's-t UCL	2.1

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	0.611	Mean	1.839
Maximum	2.39	Median	2
SD	0.478	Std. Error of Mean	0.119
Coefficient of Variation	0.26	Skewness	-2.082

Normal GOF Test

Shapiro Wilk Test Statistic	0.605	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.444	**Lilliefors GOF Test**	

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.049	95% Adjusted-CLT UCL (Chen-1995)	1.969
		95% Modified-t UCL (Johnson-1978)	2.038

Gamma GOF Test

A-D Test Statistic	3.55	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.457	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.635	k star (bias corrected MLE)	7.87
Theta hat (MLE)	0.191	Theta star (bias corrected MLE)	0.234
nu hat (MLE)	308.3	nu star (bias corrected)	251.8
MLE Mean (bias corrected)	1.839	MLE Sd (bias corrected)	0.656
		Approximate Chi Square Value (0.05)	216.1
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	212.3

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.143	95% Adjusted Gamma UCL	2.181

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.539	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.452	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.493	Mean of logged Data	0.556
Maximum of Logged Data	0.871	SD of logged Data	0.382

Assuming Lognormal Distribution

95% H-UCL	2.272	90% Chebyshev (MVUE) UCL	2.413
95% Chebyshev (MVUE) UCL	2.66	97.5% Chebyshev (MVUE) UCL	3.003
99% Chebyshev (MVUE) UCL	3.677		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.036	95% BCA Bootstrap UCL	1.981
95% Standard Bootstrap UCL	2.031	95% Bootstrap-t UCL	1.999
95% Hall's Bootstrap UCL	1.981	95% Percentile Bootstrap UCL	2.015
90% Chebyshev(Mean, Sd) UCL	2.198	95% Chebyshev(Mean, Sd) UCL	2.36
97.5% Chebyshev(Mean, Sd) UCL	2.585	99% Chebyshev(Mean, Sd) UCL	3.028

Suggested UCL to Use

95% Student's-t UCL	2.049

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	1.03	Mean	1.833
Maximum	2	Median	2
SD	0.314	Std. Error of Mean	0.0785
Coefficient of Variation	0.171	Skewness	-1.669

Normal GOF Test

Shapiro Wilk Test Statistic	0.602	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.452	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1.971	95% Adjusted-CLT UCL (Chen-1995)	1.927
		95% Modified-t UCL (Johnson-1978)	1.965

Gamma GOF Test

A-D Test Statistic	3.193	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.455	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	29.37	k star (bias corrected MLE)	23.9
Theta hat (MLE)	0.0624	Theta star (bias corrected MLE)	0.0767
nu hat (MLE)	939.8	nu star (bias corrected)	764.9
MLE Mean (bias corrected)	1.833	MLE Sd (bias corrected)	0.375
		Approximate Chi Square Value (0.05)	701.8
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	694.9

Assuming Gamma Distribution

95% Approximate Gamma UCL	1.998	95% Adjusted Gamma UCL	2.018

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.597	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.447	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.0296	Mean of logged Data	0.589
Maximum of Logged Data	0.693	SD of logged Data	0.202

Assuming Lognormal Distribution

95% H-UCL	2.02	90% Chebyshev (MVUE) UCL	2.117
95% Chebyshev (MVUE) UCL	2.244	97.5% Chebyshev (MVUE) UCL	2.42
99% Chebyshev (MVUE) UCL	2.765		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	1.962	95% BCA Bootstrap UCL	1.93
95% Standard Bootstrap UCL	1.955	95% Bootstrap-t UCL	1.94
95% Hall's Bootstrap UCL	1.929	95% Percentile Bootstrap UCL	1.941
90% Chebyshev(Mean, Sd) UCL	2.069	95% Chebyshev(Mean, Sd) UCL	2.175
97.5% Chebyshev(Mean, Sd) UCL	2.323	99% Chebyshev(Mean, Sd) UCL	2.614

Suggested UCL to Use

95% Student's-t UCL	1.971

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (radium-226/228 [pci/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	1.24	Mean	2.199
Maximum	4.83	Median	2
SD	0.837	Std. Error of Mean	0.209
Coefficient of Variation	0.38	Skewness	2.208

Normal GOF Test

Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.344	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.566	95% Adjusted-CLT UCL (Chen-1995)	2.667
		95% Modified-t UCL (Johnson-1978)	2.585

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma GOF Test

A-D Test Statistic	1.353	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.322	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.557	k star (bias corrected MLE)	7.807
Theta hat (MLE)	0.23	Theta star (bias corrected MLE)	0.282
nu hat (MLE)	305.8	nu star (bias corrected)	249.8
MLE Mean (bias corrected)	2.199	MLE Sd (bias corrected)	0.787
		Approximate Chi Square Value (0.05)	214.2
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	210.5

Assuming Gamma Distribution

95% Approximate Gamma UCL	2.565	95% Adjusted Gamma UCL	2.611

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.849	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.302	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.215	Mean of logged Data	0.735
Maximum of Logged Data	1.575	SD of logged Data	0.322

Assuming Lognormal Distribution

95% H-UCL	2.571	90% Chebyshev (MVUE) UCL	2.726
95% Chebyshev (MVUE) UCL	2.969	97.5% Chebyshev (MVUE) UCL	3.306
99% Chebyshev (MVUE) UCL	3.969		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	2.543	95% BCA Bootstrap UCL	2.674
95% Standard Bootstrap UCL	2.536	95% Bootstrap-t UCL	2.797
95% Hall's Bootstrap UCL	4.258	95% Percentile Bootstrap UCL	2.57
90% Chebyshev(Mean, Sd) UCL	2.827	95% Chebyshev(Mean, Sd) UCL	3.111
97.5% Chebyshev(Mean, Sd) UCL	3.506	99% Chebyshev(Mean, Sd) UCL	4.28

Suggested UCL to Use

95% Student's-t UCL	2.566

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (selenium [ug/l]_intrawell_apw-02)

General Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Total Number of Observations	16	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	15
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 report_result_value (selenium [ug/l]_intrawell_apw-02) was not processed!

report_result_value (selenium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	4
Number of Detects	2	Number of Non-Detects	14
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	1.9	Maximum Non-Detect	2
Variance Detects	0.32	Percent Non-Detects	87.5%
Mean Detects	1.5	SD Detects	0.566
Median Detects	1.5	CV Detects	0.377
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.369	SD of Logged Detects	0.386

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	1.067	KM Standard Error of Mean	0.0818
90KM SD	0.224	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.21	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.201	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.312	95% KM Chebyshev UCL	1.423
97.5% KM Chebyshev UCL	1.578	99% KM Chebyshev UCL	1.881

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	13.72	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.109	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	54.88	nu star (bias corrected)	N/A
Mean (detects)	1.5		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.067	SD (KM)	0.224
Variance (KM)	0.0502	SE of Mean (KM)	0.0818
k hat (KM)	22.65	k star (KM)	18.45
nu hat (KM)	725	nu star (KM)	590.4
theta hat (KM)	0.0471	theta star (KM)	0.0578

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

80% gamma percentile (KM)	1.268	90% gamma percentile (KM)	1.395
95% gamma percentile (KM)	1.505	99% gamma percentile (KM)	1.728

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0335
Approximate Chi Square Value (590.36, α)	535	Adjusted Chi Square Value (590.36, β)	529
95% KM Approximate Gamma UCL	1.177	95% KM Adjusted Gamma UCL	1.19

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	0.325	Mean in Log Scale	-1.968
SD in Original Scale	0.5	SD in Log Scale	1.356
95% t UCL (assumes normality of ROS data)	0.545	95% Percentile Bootstrap UCL	0.552
95% BCA Bootstrap UCL	0.621	95% Bootstrap t UCL	0.981
95% H-UCL (Log ROS)	1.11		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0491	KM Geo Mean	1.05
KM SD (logged)	0.16	95% Critical H Value (KM-Log)	1.776
KM Standard Error of Mean (logged)	0.0585	95% H-UCL (KM -Log)	1.145
KM SD (logged)	0.16	95% Critical H Value (KM-Log)	1.776
KM Standard Error of Mean (logged)	0.0585		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.656	Mean in Log Scale	-0.517
SD in Original Scale	0.381	SD in Log Scale	0.399
95% t UCL (Assumes normality)	0.823	95% H-Stat UCL	0.79

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

Suggested UCL to Use

95% KM (t) UCL	1.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (selenium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (selenium [ug/l]_intrawell_apw-05/05r) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (selenium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	15
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 report_result_value (selenium [ug/l]_intrawell_apw-06d) was not processed!

report_result_value (selenium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (selenium [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (selenium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (selenium [ug/l]_intrawell_apw-07) was not processed!

report_result_value (selenium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	3.6	Mean	12.93
Maximum	22.1	Median	13.35
SD	4.141	Std. Error of Mean	1.035
Coefficient of Variation	0.32	Skewness	-0.241

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Normal GOF Test

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	14.75	95% Adjusted-CLT UCL (Chen-1995)	14.57
		95% Modified-t UCL (Johnson-1978)	14.74

Gamma GOF Test

A-D Test Statistic	0.98	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.233	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.887	k star (bias corrected MLE)	6.45
Theta hat (MLE)	1.64	Theta star (bias corrected MLE)	2.005
nu hat (MLE)	252.4	nu star (bias corrected)	206.4
MLE Mean (bias corrected)	12.93	MLE Sd (bias corrected)	5.092
		Approximate Chi Square Value (0.05)	174.1
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	170.8

Assuming Gamma Distribution

95% Approximate Gamma UCL	15.33	95% Adjusted Gamma UCL	15.63

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.256	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.281	Mean of logged Data	2.495
Maximum of Logged Data	3.096	SD of logged Data	0.411

Assuming Lognormal Distribution

95% H-UCL	16.24	90% Chebyshev (MVUE) UCL	17.24
95% Chebyshev (MVUE) UCL	19.11	97.5% Chebyshev (MVUE) UCL	21.71
99% Chebyshev (MVUE) UCL	26.81		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	14.63	95% BCA Bootstrap UCL	14.45
95% Standard Bootstrap UCL	14.57	95% Bootstrap-t UCL	14.57
95% Hall's Bootstrap UCL	14.71	95% Percentile Bootstrap UCL	14.58

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

90% Chebyshev(Mean, Sd) UCL	16.04	95% Chebyshev(Mean, Sd) UCL	17.44
97.5% Chebyshev(Mean, Sd) UCL	19.4	99% Chebyshev(Mean, Sd) UCL	23.23

Suggested UCL to Use

95% Student's-t UCL	14.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (selenium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	10
Number of Detects	13	Number of Non-Detects	3
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	1.1	Minimum Non-Detect	1
Maximum Detect	3.3	Maximum Non-Detect	1
Variance Detects	0.485	Percent Non-Detects	18.75%
Mean Detects	1.784	SD Detects	0.696
Median Detects	1.6	CV Detects	0.39
Skewness Detects	1.195	Kurtosis Detects	0.293
Mean of Logged Detects	0.518	SD of Logged Detects	0.351

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.814	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.271	Detected Data Not Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.637	KM Standard Error of Mean	0.176
90KM SD	0.676	95% KM (BCA) UCL	1.943
95% KM (t) UCL	1.945	95% KM (Percentile Bootstrap) UCL	1.925
95% KM (z) UCL	1.926	95% KM Bootstrap t UCL	2.072
90% KM Chebyshev UCL	2.165	95% KM Chebyshev UCL	2.404
97.5% KM Chebyshev UCL	2.736	99% KM Chebyshev UCL	3.388

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.822	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.734	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.268	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.237	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)	8.348	k star (bias corrected MLE)	6.473
Theta hat (MLE)	0.214	Theta star (bias corrected MLE)	0.276
nu hat (MLE)	217	nu star (bias corrected)	168.3
Mean (detects)	1.784		

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

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	0.25	Mean	1.533
Maximum	3.3	Median	1.35
SD	0.827	CV	0.54
k hat (MLE)	3.081	k star (bias corrected MLE)	2.545
Theta hat (MLE)	0.497	Theta star (bias corrected MLE)	0.602
nu hat (MLE)	98.59	nu star (bias corrected)	81.44
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (81.44, α)	61.64	Adjusted Chi Square Value (81.44, β)	59.69
95% Gamma Approximate UCL	2.025	95% Gamma Adjusted UCL	2.091

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.637	SD (KM)	0.676
Variance (KM)	0.457	SE of Mean (KM)	0.176
k hat (KM)	5.859	k star (KM)	4.802
nu hat (KM)	187.5	nu star (KM)	153.7
theta hat (KM)	0.279	theta star (KM)	0.341
80% gamma percentile (KM)	2.21	90% gamma percentile (KM)	2.637
95% gamma percentile (KM)	3.027	99% gamma percentile (KM)	3.852

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (153.68, α)	126	Adjusted Chi Square Value (153.68, β)	123.2
95% KM Approximate Gamma UCL	1.996	95% KM Adjusted Gamma UCL	2.042

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**	
10% Shapiro Wilk Critical Value	0.889	Detected Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**	
10% Lilliefors Critical Value	0.215	Detected Data Not Lognormal at 10% Significance Level	

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.588	Mean in Log Scale	0.363
SD in Original Scale	0.753	SD in Log Scale	0.461
95% t UCL (assumes normality of ROS data)	1.918	95% Percentile Bootstrap UCL	1.896
95% BCA Bootstrap UCL	1.927	95% Bootstrap t UCL	2.029
95% H-UCL (Log ROS)	2.032		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.421	KM Geo Mean	1.523
KM SD (logged)	0.365	95% Critical H Value (KM-Log)	1.924
KM Standard Error of Mean (logged)	0.0951	95% H-UCL (KM -Log)	1.952
KM SD (logged)	0.365	95% Critical H Value (KM-Log)	1.924
KM Standard Error of Mean (logged)	0.0951		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.543	Mean in Log Scale	0.291

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD in Original Scale	0.81	SD in Log Scale	0.581
95% t UCL (Assumes normality)	1.898	95% H-Stat UCL	2.181

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 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.945

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (selenium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (selenium [ug/l]_intrawell_apw-10s) was not processed!

report_result_value (sulfate [mg/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	411	Mean	456.6
Maximum	500	Median	460
SD	28.6	Std. Error of Mean	7.15
Coefficient of Variation	0.0626	Skewness	-0.167

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.159	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	469.1	95% Adjusted-CLT UCL (Chen-1995)	468
		95% Modified-t UCL (Johnson-1978)	469

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma GOF Test

A-D Test Statistic	0.356	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.168	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	269.4	k star (bias corrected MLE)	219
Theta hat (MLE)	1.695	Theta star (bias corrected MLE)	2.085
nu hat (MLE)	8622	nu star (bias corrected)	7006
MLE Mean (bias corrected)	456.6	MLE Sd (bias corrected)	30.86
		Approximate Chi Square Value (0.05)	6813
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	6791

Assuming Gamma Distribution

95% Approximate Gamma UCL	469.5	95% Adjusted Gamma UCL	471

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	6.019	Mean of logged Data	6.122
Maximum of Logged Data	6.215	SD of logged Data	0.0631

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	478.2
95% Chebyshev (MVUE) UCL	488	97.5% Chebyshev (MVUE) UCL	501.6
99% Chebyshev (MVUE) UCL	528.3		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	468.3	95% BCA Bootstrap UCL	467.4
95% Standard Bootstrap UCL	467.8	95% Bootstrap-t UCL	468.4
95% Hall's Bootstrap UCL	467.6	95% Percentile Bootstrap UCL	467.6
90% Chebyshev(Mean, Sd) UCL	478	95% Chebyshev(Mean, Sd) UCL	487.7
97.5% Chebyshev(Mean, Sd) UCL	501.2	99% Chebyshev(Mean, Sd) UCL	527.7

Suggested UCL to Use

95% Student's-t UCL	469.1

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (sulfate [mg/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	80.1	Mean	212.4
Maximum	393	Median	202.5
SD	77.93	Std. Error of Mean	19.48
Coefficient of Variation	0.367	Skewness	0.738

Normal GOF Test

Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	246.6	95% Adjusted-CLT UCL (Chen-1995)	248.3
		95% Modified-t UCL (Johnson-1978)	247.2

Gamma GOF Test

A-D Test Statistic	0.226	**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	0.134	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.879	k star (bias corrected MLE)	6.443
Theta hat (MLE)	26.96	Theta star (bias corrected MLE)	32.97
nu hat (MLE)	252.1	nu star (bias corrected)	206.2
MLE Mean (bias corrected)	212.4	MLE Sd (bias corrected)	83.69
		Approximate Chi Square Value (0.05)	174
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	170.6

Assuming Gamma Distribution

95% Approximate Gamma UCL	251.8	95% Adjusted Gamma UCL	256.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.12	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.383	Mean of logged Data	5.294
Maximum of Logged Data	5.974	SD of logged Data	0.381

Assuming Lognormal Distribution

95% H-UCL	259.1	90% Chebyshev (MVUE) UCL	275.1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Chebyshev (MVUE) UCL	303.2	97.5% Chebyshev (MVUE) UCL	342.2
99% Chebyshev (MVUE) UCL	418.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	244.5	95% BCA Bootstrap UCL	245.8
95% Standard Bootstrap UCL	243.3	95% Bootstrap-t UCL	251.7
95% Hall's Bootstrap UCL	253.7	95% Percentile Bootstrap UCL	243.6
90% Chebyshev(Mean, Sd) UCL	270.9	95% Chebyshev(Mean, Sd) UCL	297.4
97.5% Chebyshev(Mean, Sd) UCL	334.1	99% Chebyshev(Mean, Sd) UCL	406.3

Suggested UCL to Use

95% Student's-t UCL	246.6

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (sulfate [mg/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	224	Mean	364.8
Maximum	460	Median	378.5
SD	57.99	Std. Error of Mean	14.5
Coefficient of Variation	0.159	Skewness	-0.654

Normal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.152	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	390.2	95% Adjusted-CLT UCL (Chen-1995)	386.1
		95% Modified-t UCL (Johnson-1978)	389.8

Gamma GOF Test

A-D Test Statistic	0.408	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	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	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	38.11	k star (bias corrected MLE)	31
Theta hat (MLE)	9.573	Theta star (bias corrected MLE)	11.77
nu hat (MLE)	1219	nu star (bias corrected)	992.1

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

MLE Mean (bias corrected)	364.8	MLE Sd (bias corrected)	65.52
		Approximate Chi Square Value (0.05)	920
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	912.1

Assuming Gamma Distribution

95% Approximate Gamma UCL	393.4	95% Adjusted Gamma UCL	396.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level	

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.412	Mean of logged Data	5.886
Maximum of Logged Data	6.131	SD of logged Data	0.173

Assuming Lognormal Distribution

95% H-UCL	395.7	90% Chebyshev (MVUE) UCL	412.7
95% Chebyshev (MVUE) UCL	434.2	97.5% Chebyshev (MVUE) UCL	464.1
99% Chebyshev (MVUE) UCL	522.8		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	388.7	95% BCA Bootstrap UCL	385
95% Standard Bootstrap UCL	387.5	95% Bootstrap-t UCL	386.9
95% Hall's Bootstrap UCL	385.8	95% Percentile Bootstrap UCL	386.3
90% Chebyshev(Mean, Sd) UCL	408.3	95% Chebyshev(Mean, Sd) UCL	428
97.5% Chebyshev(Mean, Sd) UCL	455.3	99% Chebyshev(Mean, Sd) UCL	509.1

Suggested UCL to Use

95% Student's-t UCL	390.2

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (sulfate [mg/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	180	Mean	225.6
Maximum	272	Median	222
SD	30.33	Std. Error of Mean	7.831
Coefficient of Variation	0.134	Skewness	0.192

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Normal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	239.4	95% Adjusted-CLT UCL (Chen-1995)	238.9
		95% Modified-t UCL (Johnson-1978)	239.5

Gamma GOF Test

A-D Test Statistic	0.305	**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	0.125	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	59.34	k star (bias corrected MLE)	47.52
Theta hat (MLE)	3.802	Theta star (bias corrected MLE)	4.748
nu hat (MLE)	1780	nu star (bias corrected)	1426
MLE Mean (bias corrected)	225.6	MLE Sd (bias corrected)	32.73
		Approximate Chi Square Value (0.05)	1339
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1329

Assuming Gamma Distribution

95% Approximate Gamma UCL	240.2	95% Adjusted Gamma UCL	242.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.114	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	5.193	Mean of logged Data	5.41
Maximum of Logged Data	5.606	SD of logged Data	0.135

Assuming Lognormal Distribution

95% H-UCL	240.6	90% Chebyshev (MVUE) UCL	249.2
95% Chebyshev (MVUE) UCL	259.9	97.5% Chebyshev (MVUE) UCL	274.7
99% Chebyshev (MVUE) UCL	303.9		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	238.5	95% BCA Bootstrap UCL	238.1
95% Standard Bootstrap UCL	238.1	95% Bootstrap-t UCL	239.4
95% Hall's Bootstrap UCL	238.6	95% Percentile Bootstrap UCL	238.5
90% Chebyshev(Mean, Sd) UCL	249.1	95% Chebyshev(Mean, Sd) UCL	259.7

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

97.5% Chebyshev(Mean, Sd) UCL	274.5	99% Chebyshev(Mean, Sd) UCL	303.5

Suggested UCL to Use

95% Student's-t UCL 239.4

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (sulfate [mg/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	127	Mean	205.5
Maximum	247	Median	214
SD	35.34	Std. Error of Mean	8.836
Coefficient of Variation	0.172	Skewness	-0.857

Normal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.159	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	221	95% Adjusted-CLT UCL (Chen-1995)	218
		95% Modified-t UCL (Johnson-1978)	220.7

Gamma GOF Test

A-D Test Statistic	0.573	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.173	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	31.95	k star (bias corrected MLE)	26
Theta hat (MLE)	6.432	Theta star (bias corrected MLE)	7.903
nu hat (MLE)	1022	nu star (bias corrected)	832.1
MLE Mean (bias corrected)	205.5	MLE Sd (bias corrected)	40.3
		Approximate Chi Square Value (0.05)	766.1
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	758.9

Assuming Gamma Distribution

95% Approximate Gamma UCL	223.2	95% Adjusted Gamma UCL	225.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.171	**Lilliefors Lognormal GOF Test**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.844	Mean of logged Data	5.31
Maximum of Logged Data	5.509	SD of logged Data	0.189

Assuming Lognormal Distribution

95% H-UCL	224.8	90% Chebyshev (MVUE) UCL	235.1
95% Chebyshev (MVUE) UCL	248.4	97.5% Chebyshev (MVUE) UCL	266.9
99% Chebyshev (MVUE) UCL	303.1		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	220	95% BCA Bootstrap UCL	218.3
95% Standard Bootstrap UCL	219.9	95% Bootstrap-t UCL	220
95% Hall's Bootstrap UCL	218.7	95% Percentile Bootstrap UCL	219.6
90% Chebyshev(Mean, Sd) UCL	232	95% Chebyshev(Mean, Sd) UCL	244
97.5% Chebyshev(Mean, Sd) UCL	260.7	99% Chebyshev(Mean, Sd) UCL	293.4

Suggested UCL to Use

95% Student's-t UCL	221

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (sulfate [mg/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	40	Mean	58.43
Maximum	78	Median	60
SD	10.84	Std. Error of Mean	2.709
Coefficient of Variation	0.185	Skewness	-1.046E-4

Normal GOF Test

Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.101	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.248	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	63.17	95% Adjusted-CLT UCL (Chen-1995)	62.88
		95% Modified-t UCL (Johnson-1978)	63.17

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma GOF Test

A-D Test Statistic	0.254	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.122	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	30.15	k star (bias corrected MLE)	24.54
Theta hat (MLE)	1.938	Theta star (bias corrected MLE)	2.381
nu hat (MLE)	964.7	nu star (bias corrected)	785.2
MLE Mean (bias corrected)	58.43	MLE Sd (bias corrected)	11.79
		Approximate Chi Square Value (0.05)	721.2
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	714.2

Assuming Gamma Distribution

95% Approximate Gamma UCL	63.61	95% Adjusted Gamma UCL	64.23

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.689	Mean of logged Data	4.051
Maximum of Logged Data	4.357	SD of logged Data	0.19

Assuming Lognormal Distribution

95% H-UCL	63.91	90% Chebyshev (MVUE) UCL	66.83
95% Chebyshev (MVUE) UCL	70.63	97.5% Chebyshev (MVUE) UCL	75.91
99% Chebyshev (MVUE) UCL	86.27		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	62.88	95% BCA Bootstrap UCL	62.79
95% Standard Bootstrap UCL	62.72	95% Bootstrap-t UCL	63.39
95% Hall's Bootstrap UCL	63.03	95% Percentile Bootstrap UCL	62.61
90% Chebyshev(Mean, Sd) UCL	66.55	95% Chebyshev(Mean, Sd) UCL	70.23
97.5% Chebyshev(Mean, Sd) UCL	75.34	99% Chebyshev(Mean, Sd) UCL	85.38

Suggested UCL to Use

95% Student's-t UCL	63.17

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (sulfate [mg/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	23	Mean	34.86
Maximum	43	Median	38
SD	6.449	Std. Error of Mean	1.612
Coefficient of Variation	0.185	Skewness	-0.876

Normal GOF Test

Shapiro Wilk Test Statistic	0.844	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	37.68	95% Adjusted-CLT UCL (Chen-1995)	37.13
		95% Modified-t UCL (Johnson-1978)	37.62

Gamma GOF Test

A-D Test Statistic	1.316	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.273	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	27.52	k star (bias corrected MLE)	22.4
Theta hat (MLE)	1.266	Theta star (bias corrected MLE)	1.556
nu hat (MLE)	880.7	nu star (bias corrected)	716.9
MLE Mean (bias corrected)	34.86	MLE Sd (bias corrected)	7.364
		Approximate Chi Square Value (0.05)	655.8
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	649.1

Assuming Gamma Distribution

95% Approximate Gamma UCL	38.11	95% Adjusted Gamma UCL	38.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.815	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.274	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.135	Mean of logged Data	3.533
Maximum of Logged Data	3.761	SD of logged Data	0.204

Assuming Lognormal Distribution

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% H-UCL	38.43	90% Chebyshev (MVUE) UCL	40.27
95% Chebyshev (MVUE) UCL	42.7	97.5% Chebyshev (MVUE) UCL	46.08
99% Chebyshev (MVUE) UCL	52.71		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	37.51	95% BCA Bootstrap UCL	37.17
95% Standard Bootstrap UCL	37.43	95% Bootstrap-t UCL	37.32
95% Hall's Bootstrap UCL	37.09	95% Percentile Bootstrap UCL	37.31
90% Chebyshev(Mean, Sd) UCL	39.69	95% Chebyshev(Mean, Sd) UCL	41.88
97.5% Chebyshev(Mean, Sd) UCL	44.92	99% Chebyshev(Mean, Sd) UCL	50.9

Suggested UCL to Use

95% Student's-t UCL	37.68

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution 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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (sulfate [mg/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	26	Mean	40.16
Maximum	44	Median	42
SD	5.246	Std. Error of Mean	1.312
Coefficient of Variation	0.131	Skewness	-1.777

Normal GOF Test

Shapiro Wilk Test Statistic	0.756	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.844	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.248	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	42.46	95% Adjusted-CLT UCL (Chen-1995)	41.69
		95% Modified-t UCL (Johnson-1978)	42.36

Gamma GOF Test

A-D Test Statistic	1.677	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.271	**Kolmogorov-Smirnov Gamma GOF Test**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	52.88	k star (bias corrected MLE)	43.01
Theta hat (MLE)	0.759	Theta star (bias corrected MLE)	0.934
nu hat (MLE)	1692	nu star (bias corrected)	1376
MLE Mean (bias corrected)	40.16	MLE Sd (bias corrected)	6.123
		Approximate Chi Square Value (0.05)	1291
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	1282

Assuming Gamma Distribution

95% Approximate Gamma UCL	42.8	95% Adjusted Gamma UCL	43.12

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.717	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.906	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.196	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.258	Mean of logged Data	3.683
Maximum of Logged Data	3.784	SD of logged Data	0.149

Assuming Lognormal Distribution

95% H-UCL	43.04	90% Chebyshev (MVUE) UCL	44.68
95% Chebyshev (MVUE) UCL	46.72	97.5% Chebyshev (MVUE) UCL	49.54
99% Chebyshev (MVUE) UCL	55.09		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	42.31	95% BCA Bootstrap UCL	41.78
95% Standard Bootstrap UCL	42.24	95% Bootstrap-t UCL	41.94
95% Hall's Bootstrap UCL	41.76	95% Percentile Bootstrap UCL	42.19
90% Chebyshev(Mean, Sd) UCL	44.09	95% Chebyshev(Mean, Sd) UCL	45.87
97.5% Chebyshev(Mean, Sd) UCL	48.35	99% Chebyshev(Mean, Sd) UCL	53.21

Suggested UCL to Use

95% Student's-t UCL	42.46

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (sulfate [mg/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	3

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Number of Detects	2	Number of Non-Detects	14
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	10	Minimum Non-Detect	5
Maximum Detect	21	Maximum Non-Detect	10
Variance Detects	60.5	Percent Non-Detects	87.5%
Mean Detects	15.5	SD Detects	7.778
Median Detects	15.5	CV Detects	0.502
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	2.674	SD of Logged Detects	0.525

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	6.313	KM Standard Error of Mean	1.407
90KM SD	3.98	95% KM (BCA) UCL	N/A
95% KM (t) UCL	8.779	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	8.627	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	10.53	95% KM Chebyshev UCL	12.45
97.5% KM Chebyshev UCL	15.1	99% KM Chebyshev UCL	20.31

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	7.594	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.041	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	30.38	nu star (bias corrected)	N/A
Mean (detects)	15.5		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	6.313	SD (KM)	3.98
Variance (KM)	15.84	SE of Mean (KM)	1.407
k hat (KM)	2.516	k star (KM)	2.086
nu hat (KM)	80.5	nu star (KM)	66.74
theta hat (KM)	2.509	theta star (KM)	3.027
80% gamma percentile (KM)	9.404	90% gamma percentile (KM)	12.16
95% gamma percentile (KM)	14.78	99% gamma percentile (KM)	20.57

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0335
Approximate Chi Square Value (66.74, α)	48.94	Adjusted Chi Square Value (66.74, β)	47.21
95% KM Approximate Gamma UCL	8.609	95% KM Adjusted Gamma UCL	8.925

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	2.623	Mean in Log Scale	-0.604
SD in Original Scale	5.492	SD in Log Scale	1.889

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% t UCL (assumes normality of ROS data)	5.03	95% Percentile Bootstrap UCL	4.966
95% BCA Bootstrap UCL	6.236	95% Bootstrap t UCL	14.31
95% H-UCL (Log ROS)	26		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.742	KM Geo Mean	5.711
KM SD (logged)	0.376	95% Critical H Value (KM-Log)	1.933
KM Standard Error of Mean (logged)	0.133	95% H-UCL (KM -Log)	7.392
KM SD (logged)	0.376	95% Critical H Value (KM-Log)	1.933
KM Standard Error of Mean (logged)	0.133		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	6.156	Mean in Log Scale	1.699
SD in Original Scale	4.21	SD in Log Scale	0.439
95% t UCL (Assumes normality)	8.001	95% H-Stat UCL	7.547

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

Suggested UCL to Use

95% KM (t) UCL	8.779

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (thallium [ug/l]_intrawell_apw-02)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-02) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-03)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-03) was not processed!

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

report_result_value (thallium [ug/l]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-05/05r) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-06d)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	15
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 report_result_value (thallium [ug/l]_intrawell_apw-06d) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-06s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-06s) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-07)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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).

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

The data set for variable report_result_value (thallium [ug/l]_intrawell_apw-07) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-08)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-08) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-10d)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-10d) was not processed!

report_result_value (thallium [ug/l]_intrawell_apw-10s)

General Statistics

Total Number of Observations	16	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	16
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 report_result_value (thallium [ug/l]_intrawell_apw-10s) was not processed!

report_result_value (turbidity, field [ntu]_intrawell_apw-02)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	19.2	Mean	94.64
Maximum	169	Median	100.5

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

SD	47.83	Std. Error of Mean	16.91
Coefficient of Variation	0.505	Skewness	-0.254

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.241	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	126.7	95% Adjusted-CLT UCL (Chen-1995)	120.8
		95% Modified-t UCL (Johnson-1978)	126.4

Gamma GOF Test

A-D Test Statistic	0.595	**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	0.319	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.296	Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	3.034	k star (bias corrected MLE)	1.98
Theta hat (MLE)	31.19	Theta star (bias corrected MLE)	47.8
nu hat (MLE)	48.55	nu star (bias corrected)	31.68
MLE Mean (bias corrected)	94.64	MLE Sd (bias corrected)	67.26
		Approximate Chi Square Value (0.05)	19.82
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	17.48

Assuming Gamma Distribution

95% Approximate Gamma UCL	151.3	95% Adjusted Gamma UCL	171.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.834	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.851	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.34	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.265	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.955	Mean of logged Data	4.376
Maximum of Logged Data	5.13	SD of logged Data	0.717

Assuming Lognormal Distribution

95% H-UCL	218.1	90% Chebyshev (MVUE) UCL	175.7

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

95% Chebyshev (MVUE) UCL	210.5	97.5% Chebyshev (MVUE) UCL	258.7
99% Chebyshev (MVUE) UCL	353.3		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	122.5	95% BCA Bootstrap UCL	119
95% Standard Bootstrap UCL	121.2	95% Bootstrap-t UCL	125
95% Hall's Bootstrap UCL	123.3	95% Percentile Bootstrap UCL	120
90% Chebyshev(Mean, Sd) UCL	145.4	95% Chebyshev(Mean, Sd) UCL	168.3
97.5% Chebyshev(Mean, Sd) UCL	200.2	99% Chebyshev(Mean, Sd) UCL	262.9

Suggested UCL to Use

95% Student's-t UCL	126.7

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

report_result_value (turbidity, field [ntu]_intrawell_apw-03)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	2.72	Mean	33.75
Maximum	103	Median	23.71
SD	35.76	Std. Error of Mean	12.64
Coefficient of Variation	1.06	Skewness	1.05

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach, refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance, but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7). The Chebyshev UCL often results in gross overestimates of the mean. Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.272	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level	

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	57.7	95% Adjusted-CLT UCL (Chen-1995)	59.56
		95% Modified-t UCL (Johnson-1978)	58.48

Gamma GOF Test

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

A-D Test Statistic	0.525	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.267	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	0.827	k star (bias corrected MLE)	0.6
Theta hat (MLE)	40.82	Theta star (bias corrected MLE)	56.25
nu hat (MLE)	13.23	nu star (bias corrected)	9.6
MLE Mean (bias corrected)	33.75	MLE Sd (bias corrected)	43.57
		Approximate Chi Square Value (0.05)	3.693
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	2.828

Assuming Gamma Distribution

95% Approximate Gamma UCL	87.72	95% Adjusted Gamma UCL	114.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.237	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	1.001	Mean of logged Data	2.804
Maximum of Logged Data	4.635	SD of logged Data	1.408

Assuming Lognormal Distribution

95% H-UCL	485.9	90% Chebyshev (MVUE) UCL	92.09
95% Chebyshev (MVUE) UCL	117.2	97.5% Chebyshev (MVUE) UCL	152
99% Chebyshev (MVUE) UCL	220.5		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	54.54	95% BCA Bootstrap UCL	57.08
95% Standard Bootstrap UCL	53.43	95% Bootstrap-t UCL	68.16
95% Hall's Bootstrap UCL	58.47	95% Percentile Bootstrap UCL	53.82
90% Chebyshev(Mean, Sd) UCL	71.67	95% Chebyshev(Mean, Sd) UCL	88.85
97.5% Chebyshev(Mean, Sd) UCL	112.7	99% Chebyshev(Mean, Sd) UCL	159.5

Suggested UCL to Use

95% Student's-t UCL	57.7

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods,

then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-05/05r)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	4.65	Mean	33.14
Maximum	76.1	Median	36.3
SD	24.85	Std. Error of Mean	8.787
Coefficient of Variation	0.75	Skewness	0.427

**Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.**

Normal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	49.79	95% Adjusted-CLT UCL (Chen-1995)	49.01
		95% Modified-t UCL (Johnson-1978)	50.01

Gamma GOF Test

A-D Test Statistic	0.462	**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	0.241	**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
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	1.507	k star (bias corrected MLE)	1.025
Theta hat (MLE)	21.99	Theta star (bias corrected MLE)	32.33
nu hat (MLE)	24.11	nu star (bias corrected)	16.4
MLE Mean (bias corrected)	33.14	MLE Sd (bias corrected)	32.73
		Approximate Chi Square Value (0.05)	8.248
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	6.837

Assuming Gamma Distribution

95% Approximate Gamma UCL	65.92	95% Adjusted Gamma UCL	79.52

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk Lognormal GOF Test**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.271	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.265	Data Not Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level
Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	1.537	Mean of logged Data	3.134
Maximum of Logged Data	4.332	SD of logged Data	1.025

Assuming Lognormal Distribution

95% H-UCL	149.8	90% Chebyshev (MVUE) UCL	75.09
95% Chebyshev (MVUE) UCL	92.99	97.5% Chebyshev (MVUE) UCL	117.8
99% Chebyshev (MVUE) UCL	166.6		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	47.6	95% BCA Bootstrap UCL	47.98
95% Standard Bootstrap UCL	46.86	95% Bootstrap-t UCL	51.18
95% Hall's Bootstrap UCL	49.59	95% Percentile Bootstrap UCL	46.93
90% Chebyshev(Mean, Sd) UCL	59.5	95% Chebyshev(Mean, Sd) UCL	71.44
97.5% Chebyshev(Mean, Sd) UCL	88.02	99% Chebyshev(Mean, Sd) UCL	120.6

Suggested UCL to Use

95% Student's-t UCL	49.79

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-06d)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	3.02	Mean	55.36
Maximum	181	Median	26.9
SD	61.29	Std. Error of Mean	23.17
Coefficient of Variation	1.107	Skewness	1.746

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.803	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.73	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.25	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.35	Data appear Normal at 1% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	100.4	95% Adjusted-CLT UCL (Chen-1995)	109.8
		95% Modified-t UCL (Johnson-1978)	102.9

Gamma GOF Test

A-D Test Statistic	0.247	**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	0.18	**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

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	0.968	k star (bias corrected MLE)	0.648
Theta hat (MLE)	57.19	Theta star (bias corrected MLE)	85.39
nu hat (MLE)	13.55	nu star (bias corrected)	9.077
MLE Mean (bias corrected)	55.36	MLE Sd (bias corrected)	68.75
		Approximate Chi Square Value (0.05)	3.373
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	2.413

Assuming Gamma Distribution

95% Approximate Gamma UCL	149	95% Adjusted Gamma UCL	208.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.838	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.28	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	1.105	Mean of logged Data	3.415
Maximum of Logged Data	5.198	SD of logged Data	1.318

Assuming Lognormal Distribution

95% H-UCL	877.4	90% Chebyshev (MVUE) UCL	149.9
95% Chebyshev (MVUE) UCL	190.5	97.5% Chebyshev (MVUE) UCL	246.7
99% Chebyshev (MVUE) UCL	357.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	93.46	95% BCA Bootstrap UCL	110.8
95% Standard Bootstrap UCL	90.84	95% Bootstrap-t UCL	148.8
95% Hall's Bootstrap UCL	227.2	95% Percentile Bootstrap UCL	93.87
90% Chebyshev(Mean, Sd) UCL	124.9	95% Chebyshev(Mean, Sd) UCL	156.3
97.5% Chebyshev(Mean, Sd) UCL	200	99% Chebyshev(Mean, Sd) UCL	285.9

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Suggested UCL to Use

95% Student's-t UCL 100.4

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-06s)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	1.26	Mean	10.06
Maximum	30.5	Median	7.83
SD	9.258	Std. Error of Mean	3.273
Coefficient of Variation	0.92	Skewness	1.813

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.819	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.293	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16.26	95% Adjusted-CLT UCL (Chen-1995)	17.68
		95% Modified-t UCL (Johnson-1978)	16.61

Gamma GOF Test

A-D Test Statistic	0.209	**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	0.191	**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
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	1.529	k star (bias corrected MLE)	1.039
Theta hat (MLE)	6.576	Theta star (bias corrected MLE)	9.678
nu hat (MLE)	24.47	nu star (bias corrected)	16.63

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

MLE Mean (bias corrected)	10.06	MLE Sd (bias corrected)	9.866
		Approximate Chi Square Value (0.05)	8.407
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	6.981

Assuming Gamma Distribution

95% Approximate Gamma UCL	19.89	95% Adjusted Gamma UCL	23.96

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.155	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level	

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	0.231	Mean of logged Data	1.947
Maximum of Logged Data	3.418	SD of logged Data	0.959

Assuming Lognormal Distribution

95% H-UCL	37.06	90% Chebyshev (MVUE) UCL	21.02
95% Chebyshev (MVUE) UCL	25.87	97.5% Chebyshev (MVUE) UCL	32.6
99% Chebyshev (MVUE) UCL	45.82		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	15.44	95% BCA Bootstrap UCL	17.16
95% Standard Bootstrap UCL	15.13	95% Bootstrap-t UCL	24.03
95% Hall's Bootstrap UCL	44.57	95% Percentile Bootstrap UCL	15.5
90% Chebyshev(Mean, Sd) UCL	19.88	95% Chebyshev(Mean, Sd) UCL	24.32
97.5% Chebyshev(Mean, Sd) UCL	30.5	99% Chebyshev(Mean, Sd) UCL	42.62

Suggested UCL to Use

95% Student's-t UCL	16.26

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-07)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	4.36	Mean	34.22
Maximum	79.2	Median	27.9
SD	27.07	Std. Error of Mean	9.569
Coefficient of Variation	0.791	Skewness	0.718

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach, refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	52.35	95% Adjusted-CLT UCL (Chen-1995)	52.56
		95% Modified-t UCL (Johnson-1978)	52.75

Gamma GOF Test

A-D Test Statistic	0.172	**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	0.131	**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
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	1.561	k star (bias corrected MLE)	1.059
Theta hat (MLE)	21.92	Theta star (bias corrected MLE)	32.31
nu hat (MLE)	24.98	nu star (bias corrected)	16.94
MLE Mean (bias corrected)	34.22	MLE Sd (bias corrected)	33.25
		Approximate Chi Square Value (0.05)	8.632
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	7.183

Assuming Gamma Distribution

95% Approximate Gamma UCL	67.17	95% Adjusted Gamma UCL	80.72

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.147	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level
Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	1.472	Mean of logged Data	3.18
Maximum of Logged Data	4.372	SD of logged Data	0.984

Assuming Lognormal Distribution

95% H-UCL	137.3	90% Chebyshev (MVUE) UCL	74.45
95% Chebyshev (MVUE) UCL	91.85	97.5% Chebyshev (MVUE) UCL	116
99% Chebyshev (MVUE) UCL	163.4		

Nonparametric Distribution Free UCL Statistics

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	49.96	95% BCA Bootstrap UCL	51.97
95% Standard Bootstrap UCL	49.03	95% Bootstrap-t UCL	59.88
95% Hall's Bootstrap UCL	58.25	95% Percentile Bootstrap UCL	49.9
90% Chebyshev(Mean, Sd) UCL	62.93	95% Chebyshev(Mean, Sd) UCL	75.93
97.5% Chebyshev(Mean, Sd) UCL	93.98	99% Chebyshev(Mean, Sd) UCL	129.4

Suggested UCL to Use

95% Student's-t UCL	52.35

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-08)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	23.1	Mean	134.4
Maximum	305	Median	140
SD	88.53	Std. Error of Mean	31.3
Coefficient of Variation	0.659	Skewness	0.657

**Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.**

Normal GOF Test

Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.223	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	193.7	95% Adjusted-CLT UCL (Chen-1995)	193.6
		95% Modified-t UCL (Johnson-1978)	194.9

Gamma GOF Test

A-D Test Statistic	0.649	**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	0.281	**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
Note GOF tests may be unreliable for small sample sizes

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Gamma Statistics

k hat (MLE)	1.938	k star (bias corrected MLE)	1.295
Theta hat (MLE)	69.32	Theta star (bias corrected MLE)	103.8
nu hat (MLE)	31.02	nu star (bias corrected)	20.72
MLE Mean (bias corrected)	134.4	MLE Sd (bias corrected)	118.1
		Approximate Chi Square Value (0.05)	11.38
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	9.68

Assuming Gamma Distribution

95% Approximate Gamma UCL	244.6	95% Adjusted Gamma UCL	287.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.851	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.319	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.265	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.14	Mean of logged Data	4.621
Maximum of Logged Data	5.72	SD of logged Data	0.912

Assuming Lognormal Distribution

95% H-UCL	465.8	90% Chebyshev (MVUE) UCL	286.5
95% Chebyshev (MVUE) UCL	351	97.5% Chebyshev (MVUE) UCL	440.5
99% Chebyshev (MVUE) UCL	616.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	185.9	95% BCA Bootstrap UCL	191.3
95% Standard Bootstrap UCL	183.7	95% Bootstrap-t UCL	197.3
95% Hall's Bootstrap UCL	215.8	95% Percentile Bootstrap UCL	187.6
90% Chebyshev(Mean, Sd) UCL	228.3	95% Chebyshev(Mean, Sd) UCL	270.8
97.5% Chebyshev(Mean, Sd) UCL	329.8	99% Chebyshev(Mean, Sd) UCL	445.8

Suggested UCL to Use

95% Student's-t UCL	193.7

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-10d)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	4.76	Mean	87.03
Maximum	196	Median	46.1
SD	78.77	Std. Error of Mean	27.85
Coefficient of Variation	0.905	Skewness	0.564

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.811	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	139.8	95% Adjusted-CLT UCL (Chen-1995)	138.8
		95% Modified-t UCL (Johnson-1978)	140.7

Gamma GOF Test

A-D Test Statistic	0.453	**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	0.235	**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
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	1.077	k star (bias corrected MLE)	0.757
Theta hat (MLE)	80.77	Theta star (bias corrected MLE)	115
nu hat (MLE)	17.24	nu star (bias corrected)	12.11
MLE Mean (bias corrected)	87.03	MLE Sd (bias corrected)	100
		Approximate Chi Square Value (0.05)	5.298
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.216

Assuming Gamma Distribution

95% Approximate Gamma UCL	198.9	95% Adjusted Gamma UCL	249.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.851	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.202	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.265	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level
Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	1.56	Mean of logged Data	3.935
Maximum of Logged Data	5.278	SD of logged Data	1.268

Assuming Lognormal Distribution

95% H-UCL	821.9	90% Chebyshev (MVUE) UCL	233.6
95% Chebyshev (MVUE) UCL	294.7	97.5% Chebyshev (MVUE) UCL	379.6

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

99% Chebyshev (MVUE) UCL	546.2

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	132.8	95% BCA Bootstrap UCL	136.1
95% Standard Bootstrap UCL	129.6	95% Bootstrap-t UCL	146.4
95% Hall's Bootstrap UCL	118.1	95% Percentile Bootstrap UCL	129.4
90% Chebyshev(Mean, Sd) UCL	170.6	95% Chebyshev(Mean, Sd) UCL	208.4
97.5% Chebyshev(Mean, Sd) UCL	261	99% Chebyshev(Mean, Sd) UCL	364.1

Suggested UCL to Use

95% Student's-t UCL	139.8

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

report_result_value (turbidity, field [ntu]_intrawell_apw-10s)

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	3.78	Mean	40.42
Maximum	63.6	Median	44.95
SD	22.51	Std. Error of Mean	7.959
Coefficient of Variation	0.557	Skewness	-0.693

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.749	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.333	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	55.5	95% Adjusted-CLT UCL (Chen-1995)	51.43
		95% Modified-t UCL (Johnson-1978)	55.18

Gamma GOF Test

A-D Test Statistic	0.679	**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	0.26	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.298	Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 2/29/2024 7:30:26 PM
From File	filea1b878952361.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	1.922	k star (bias corrected MLE)	1.284
Theta hat (MLE)	21.04	Theta star (bias corrected MLE)	31.47
nu hat (MLE)	30.75	nu star (bias corrected)	20.55
MLE Mean (bias corrected)	40.42	MLE Sd (bias corrected)	35.67
		Approximate Chi Square Value (0.05)	11.26
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	9.566

Assuming Gamma Distribution

95% Approximate Gamma UCL	73.79	95% Adjusted Gamma UCL	86.83

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.776	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.851	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.297	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.265	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.33	Mean of logged Data	3.417
Maximum of Logged Data	4.153	SD of logged Data	0.989

Assuming Lognormal Distribution

95% H-UCL	177.3	90% Chebyshev (MVUE) UCL	95.13
95% Chebyshev (MVUE) UCL	117.4	97.5% Chebyshev (MVUE) UCL	148.4
99% Chebyshev (MVUE) UCL	209.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	53.51	95% BCA Bootstrap UCL	50.93
95% Standard Bootstrap UCL	52.79	95% Bootstrap-t UCL	53.68
95% Hall's Bootstrap UCL	50.71	95% Percentile Bootstrap UCL	52.05
90% Chebyshev(Mean, Sd) UCL	64.3	95% Chebyshev(Mean, Sd) UCL	75.12
97.5% Chebyshev(Mean, Sd) UCL	90.13	99% Chebyshev(Mean, Sd) UCL	119.6

Suggested UCL to Use

95% Student's-t UCL	55.5

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 using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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.

group	D_report_result_value	report_result_value
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	464
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	514
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	486
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	450
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	554
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	504
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	498
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	456
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	724
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	602
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	610
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	524
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	614
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	636
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	556
Dissolved Solids, Total [mg/L]_Intrawell_APW-03	1	489
Lead [ug/L]_Intrawell_APW-03	1	2.1
Lead [ug/L]_Intrawell_APW-03	1	4.2
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	1	1.3
Lead [ug/L]_Intrawell_APW-03	1	2.3
Lead [ug/L]_Intrawell_APW-03	1	2.9
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	1	4.4
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	1
Lead [ug/L]_Intrawell_APW-03	0	2
Lithium [ug/L]_Intrawell_APW-03	1	25.8
Lithium [ug/L]_Intrawell_APW-03	1	26.2
Lithium [ug/L]_Intrawell_APW-03	1	25.9
Lithium [ug/L]_Intrawell_APW-03	1	24.5
Lithium [ug/L]_Intrawell_APW-03	1	30.8
Lithium [ug/L]_Intrawell_APW-03	1	27
Lithium [ug/L]_Intrawell_APW-03	1	35
Lithium [ug/L]_Intrawell_APW-03	1	23.9
Lithium [ug/L]_Intrawell_APW-03	1	36.1
Lithium [ug/L]_Intrawell_APW-03	1	32.9
Lithium [ug/L]_Intrawell_APW-03	1	29
Lithium [ug/L]_Intrawell_APW-03	1	27.6
Lithium [ug/L]_Intrawell_APW-03	1	35.2
Lithium [ug/L]_Intrawell_APW-03	1	31.2
Lithium [ug/L]_Intrawell_APW-03	1	32.4
Lithium [ug/L]_Intrawell_APW-03	1	31.6
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	1
Thallium [ug/L]_Intrawell_APW-03	0	2
Thallium [ug/L]_Intrawell_APW-03	0	2
Thallium [ug/L]_Intrawell_APW-03	0	2
Thallium [ug/L]_Intrawell_APW-03	0	2
Thallium [ug/L]_Intrawell_APW-03	0	2
Thallium [ug/L]_Intrawell_APW-03	0	2
Thallium [ug/L]_Intrawell_APW-03	0	2
Antimony [ug/L]_Intrawell_APW-03	0	1

group	D_report_result_value	report_result_value
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	1
Antimony [ug/L]_Intrawell_APW-03	0	4
Arsenic [ug/L]_Intrawell_APW-03	1	2.2
Arsenic [ug/L]_Intrawell_APW-03	1	2.9
Arsenic [ug/L]_Intrawell_APW-03	1	2.1
Arsenic [ug/L]_Intrawell_APW-03	1	1.8
Arsenic [ug/L]_Intrawell_APW-03	1	2.3
Arsenic [ug/L]_Intrawell_APW-03	1	2.4
Arsenic [ug/L]_Intrawell_APW-03	1	2.8
Arsenic [ug/L]_Intrawell_APW-03	1	1.8
Arsenic [ug/L]_Intrawell_APW-03	1	2
Arsenic [ug/L]_Intrawell_APW-03	1	4.6
Arsenic [ug/L]_Intrawell_APW-03	1	5.9
Arsenic [ug/L]_Intrawell_APW-03	1	3
Arsenic [ug/L]_Intrawell_APW-03	1	4
Arsenic [ug/L]_Intrawell_APW-03	1	1.7
Arsenic [ug/L]_Intrawell_APW-03	1	2
Arsenic [ug/L]_Intrawell_APW-03	0	2
Barium [ug/L]_Intrawell_APW-03	1	111
Barium [ug/L]_Intrawell_APW-03	1	146
Barium [ug/L]_Intrawell_APW-03	1	104
Barium [ug/L]_Intrawell_APW-03	1	81.4
Barium [ug/L]_Intrawell_APW-03	1	121
Barium [ug/L]_Intrawell_APW-03	1	100
Barium [ug/L]_Intrawell_APW-03	1	150
Barium [ug/L]_Intrawell_APW-03	1	80.6
Barium [ug/L]_Intrawell_APW-03	1	158
Barium [ug/L]_Intrawell_APW-03	1	181
Barium [ug/L]_Intrawell_APW-03	1	190
Barium [ug/L]_Intrawell_APW-03	1	135
Barium [ug/L]_Intrawell_APW-03	1	155
Barium [ug/L]_Intrawell_APW-03	1	137
Barium [ug/L]_Intrawell_APW-03	1	167
Barium [ug/L]_Intrawell_APW-03	1	123
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	1
Beryllium [ug/L]_Intrawell_APW-03	0	2
Boron [mg/L]_Intrawell_APW-03	1	4.16
Boron [mg/L]_Intrawell_APW-03	1	4.21

group	D_report_result_value	report_result_value
Boron [mg/L]_Intrawell_APW-03	1	4.7
Boron [mg/L]_Intrawell_APW-03	1	4.67
Boron [mg/L]_Intrawell_APW-03	1	4.44
Boron [mg/L]_Intrawell_APW-03	1	4.52
Boron [mg/L]_Intrawell_APW-03	1	4.08
Boron [mg/L]_Intrawell_APW-03	1	4.92
Boron [mg/L]_Intrawell_APW-03	1	4.27
Boron [mg/L]_Intrawell_APW-03	1	1.84
Boron [mg/L]_Intrawell_APW-03	1	3.59
Boron [mg/L]_Intrawell_APW-03	1	4.94
Boron [mg/L]_Intrawell_APW-03	1	4.67
Boron [mg/L]_Intrawell_APW-03	1	4.19
Boron [mg/L]_Intrawell_APW-03	1	2.22
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	1	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Cadmium [ug/L]_Intrawell_APW-03	0	1
Chromium [ug/L]_Intrawell_APW-03	1	8.1
Chromium [ug/L]_Intrawell_APW-03	1	5.3
Chromium [ug/L]_Intrawell_APW-03	1	2.6
Chromium [ug/L]_Intrawell_APW-03	0	1
Chromium [ug/L]_Intrawell_APW-03	0	1
Chromium [ug/L]_Intrawell_APW-03	1	5
Chromium [ug/L]_Intrawell_APW-03	1	2.5
Chromium [ug/L]_Intrawell_APW-03	0	1
Chromium [ug/L]_Intrawell_APW-03	1	4.4
Chromium [ug/L]_Intrawell_APW-03	1	8.3
Chromium [ug/L]_Intrawell_APW-03	1	11.8
Chromium [ug/L]_Intrawell_APW-03	1	1.9
Chromium [ug/L]_Intrawell_APW-03	1	24.1
Chromium [ug/L]_Intrawell_APW-03	0	1.5
Chromium [ug/L]_Intrawell_APW-03	0	1.5
Chromium [ug/L]_Intrawell_APW-03	0	2
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	1	1.5
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	1	1
Cobalt [ug/L]_Intrawell_APW-03	1	1.4
Cobalt [ug/L]_Intrawell_APW-03	1	2.1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	1	1.4
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	1
Cobalt [ug/L]_Intrawell_APW-03	0	2
Calcium [mg/L]_Intrawell_APW-03	1	86.3
Calcium [mg/L]_Intrawell_APW-03	1	104
Calcium [mg/L]_Intrawell_APW-03	1	88.1
Calcium [mg/L]_Intrawell_APW-03	1	74.9

group	D_report_result_value	report_result_value
Calcium [mg/L]_Intrawell_APW-03	1	116
Calcium [mg/L]_Intrawell_APW-03	1	95
Calcium [mg/L]_Intrawell_APW-03	1	101
Calcium [mg/L]_Intrawell_APW-03	1	77.1
Calcium [mg/L]_Intrawell_APW-03	1	153
Calcium [mg/L]_Intrawell_APW-03	1	143
Calcium [mg/L]_Intrawell_APW-03	1	115
Calcium [mg/L]_Intrawell_APW-03	1	111
Calcium [mg/L]_Intrawell_APW-03	1	139
Calcium [mg/L]_Intrawell_APW-03	1	124
Calcium [mg/L]_Intrawell_APW-03	1	115
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	1	1.1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	0	1
Selenium [ug/L]_Intrawell_APW-03	1	1.9
Selenium [ug/L]_Intrawell_APW-03	0	2
Molybdenum [ug/L]_Intrawell_APW-03	1	77.8
Molybdenum [ug/L]_Intrawell_APW-03	1	75.4
Molybdenum [ug/L]_Intrawell_APW-03	1	76.1
Molybdenum [ug/L]_Intrawell_APW-03	1	71.3
Molybdenum [ug/L]_Intrawell_APW-03	1	68.4
Molybdenum [ug/L]_Intrawell_APW-03	1	74.8
Molybdenum [ug/L]_Intrawell_APW-03	1	82.4
Molybdenum [ug/L]_Intrawell_APW-03	1	84.9
Molybdenum [ug/L]_Intrawell_APW-03	1	60.1
Molybdenum [ug/L]_Intrawell_APW-03	1	41.3
Molybdenum [ug/L]_Intrawell_APW-03	1	62.1
Molybdenum [ug/L]_Intrawell_APW-03	1	52.8
Molybdenum [ug/L]_Intrawell_APW-03	1	55.3
Molybdenum [ug/L]_Intrawell_APW-03	1	55.8
Molybdenum [ug/L]_Intrawell_APW-03	1	31.9
Molybdenum [ug/L]_Intrawell_APW-03	1	26.2
Nickel [ug/L]_Intrawell_APW-03	1	5.5
Nickel [ug/L]_Intrawell_APW-03	1	5.1
Nickel [ug/L]_Intrawell_APW-03	1	1.9
Nickel [ug/L]_Intrawell_APW-03	0	1
Nickel [ug/L]_Intrawell_APW-03	0	1
Nickel [ug/L]_Intrawell_APW-03	1	2.6
Nickel [ug/L]_Intrawell_APW-03	1	2.5
Nickel [ug/L]_Intrawell_APW-03	1	1
Nickel [ug/L]_Intrawell_APW-03	1	3.3
Nickel [ug/L]_Intrawell_APW-03	1	10
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2

group	D_report_result_value	report_result_value
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Mercury [ug/L]_Intrawell_APW-03	0	0.2
Sulfate [mg/L]_Intrawell_APW-03	1	175
Sulfate [mg/L]_Intrawell_APW-03	1	222
Sulfate [mg/L]_Intrawell_APW-03	1	201
Sulfate [mg/L]_Intrawell_APW-03	1	207
Sulfate [mg/L]_Intrawell_APW-03	1	204
Sulfate [mg/L]_Intrawell_APW-03	1	168
Sulfate [mg/L]_Intrawell_APW-03	1	152
Sulfate [mg/L]_Intrawell_APW-03	1	194
Sulfate [mg/L]_Intrawell_APW-03	1	393
Sulfate [mg/L]_Intrawell_APW-03	1	150
Sulfate [mg/L]_Intrawell_APW-03	1	226
Sulfate [mg/L]_Intrawell_APW-03	1	322
Sulfate [mg/L]_Intrawell_APW-03	1	292
Sulfate [mg/L]_Intrawell_APW-03	1	280
Sulfate [mg/L]_Intrawell_APW-03	1	133
Sulfate [mg/L]_Intrawell_APW-03	1	80.1
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2.58
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	1.37
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2.09
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	0.776
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-03	1	3.18
pH, Lab [SU]_Intrawell_APW-03	1	7.88
pH, Lab [SU]_Intrawell_APW-03	1	7.46
pH, Lab [SU]_Intrawell_APW-03	1	7.65
pH, Lab [SU]_Intrawell_APW-03	1	7.93
pH, Lab [SU]_Intrawell_APW-03	1	7.5
pH, Lab [SU]_Intrawell_APW-03	1	7.48
pH, Lab [SU]_Intrawell_APW-03	1	7.26
pH, Lab [SU]_Intrawell_APW-03	1	7.78
pH, Lab [SU]_Intrawell_APW-03	1	7.85
pH, Lab [SU]_Intrawell_APW-03	1	7.46
pH, Lab [SU]_Intrawell_APW-03	1	7.21
pH, Lab [SU]_Intrawell_APW-03	1	7.45
pH, Lab [SU]_Intrawell_APW-03	1	7.77
pH, Lab [SU]_Intrawell_APW-03	1	7.84
pH, Lab [SU]_Intrawell_APW-03	1	7.24
pH, Lab [SU]_Intrawell_APW-03	1	7.4
Fluoride [ug/L]_Intrawell_APW-03	1	280
Fluoride [ug/L]_Intrawell_APW-03	1	290
Fluoride [ug/L]_Intrawell_APW-03	1	290
Fluoride [ug/L]_Intrawell_APW-03	1	310
Fluoride [ug/L]_Intrawell_APW-03	1	270
Fluoride [ug/L]_Intrawell_APW-03	1	290
Fluoride [ug/L]_Intrawell_APW-03	1	290
Fluoride [ug/L]_Intrawell_APW-03	1	340
Fluoride [ug/L]_Intrawell_APW-03	1	260
Fluoride [ug/L]_Intrawell_APW-03	1	200
Fluoride [ug/L]_Intrawell_APW-03	1	260
Fluoride [ug/L]_Intrawell_APW-03	1	230
Fluoride [ug/L]_Intrawell_APW-03	1	230

group	D_report_result_value	report_result_value
Fluoride [ug/L]_Intrawell_APW-03	1	250
Fluoride [ug/L]_Intrawell_APW-03	1	240
Fluoride [ug/L]_Intrawell_APW-03	1	202
Chloride [mg/L]_Intrawell_APW-03	1	22
Chloride [mg/L]_Intrawell_APW-03	1	21
Chloride [mg/L]_Intrawell_APW-03	1	21
Chloride [mg/L]_Intrawell_APW-03	1	22
Chloride [mg/L]_Intrawell_APW-03	1	19
Chloride [mg/L]_Intrawell_APW-03	1	20
Chloride [mg/L]_Intrawell_APW-03	1	16
Chloride [mg/L]_Intrawell_APW-03	1	23
Chloride [mg/L]_Intrawell_APW-03	1	20
Chloride [mg/L]_Intrawell_APW-03	1	16
Chloride [mg/L]_Intrawell_APW-03	1	20
Chloride [mg/L]_Intrawell_APW-03	1	21
Chloride [mg/L]_Intrawell_APW-03	1	17
Chloride [mg/L]_Intrawell_APW-03	1	16
Chloride [mg/L]_Intrawell_APW-03	1	11
Chloride [mg/L]_Intrawell_APW-03	1	8.04
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	1.48
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	1.75
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	0.798
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	6.34
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-05/05R	1	3.86
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	842
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	832
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	804
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	826
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	790
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	792
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	552
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	804
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	650
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	750
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	714
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	696
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	740
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	680
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	705
Dissolved Solids, Total [mg/L]_Intrawell_APW-05/05R	1	677
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	0	1
Lead [ug/L]_Intrawell_APW-05/05R	1	1.1
Lead [ug/L]_Intrawell_APW-05/05R	1	2.6
Lead [ug/L]_Intrawell_APW-05/05R	1	2

group	D_report_result_value	report_result_value
Lead [ug/L]_Intrawell_APW-05/05R	0	2
Lithium [ug/L]_Intrawell_APW-05/05R	1	36.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	44.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	39.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	40.5
Lithium [ug/L]_Intrawell_APW-05/05R	1	41.5
Lithium [ug/L]_Intrawell_APW-05/05R	1	43.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	40.4
Lithium [ug/L]_Intrawell_APW-05/05R	1	39.7
Lithium [ug/L]_Intrawell_APW-05/05R	1	33.1
Lithium [ug/L]_Intrawell_APW-05/05R	1	40.8
Lithium [ug/L]_Intrawell_APW-05/05R	1	37.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	39.9
Lithium [ug/L]_Intrawell_APW-05/05R	1	42.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	36.7
Lithium [ug/L]_Intrawell_APW-05/05R	1	52.3
Lithium [ug/L]_Intrawell_APW-05/05R	1	38.8
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	1
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Thallium [ug/L]_Intrawell_APW-05/05R	0	2
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	1	1.1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	1
Antimony [ug/L]_Intrawell_APW-05/05R	0	4
Arsenic [ug/L]_Intrawell_APW-05/05R	1	3.1
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.6
Arsenic [ug/L]_Intrawell_APW-05/05R	1	1.5
Arsenic [ug/L]_Intrawell_APW-05/05R	1	1.6
Arsenic [ug/L]_Intrawell_APW-05/05R	1	1.6
Arsenic [ug/L]_Intrawell_APW-05/05R	1	1.9
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.1
Arsenic [ug/L]_Intrawell_APW-05/05R	1	1.9
Arsenic [ug/L]_Intrawell_APW-05/05R	1	4.8
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.5
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.2
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.4
Arsenic [ug/L]_Intrawell_APW-05/05R	1	3
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.8
Arsenic [ug/L]_Intrawell_APW-05/05R	1	4.2
Arsenic [ug/L]_Intrawell_APW-05/05R	1	2.2

group	D_report_result_value	report_result_value
Barium [ug/L]_Intrawell_APW-05/05R	1	226
Barium [ug/L]_Intrawell_APW-05/05R	1	233
Barium [ug/L]_Intrawell_APW-05/05R	1	183
Barium [ug/L]_Intrawell_APW-05/05R	1	216
Barium [ug/L]_Intrawell_APW-05/05R	1	193
Barium [ug/L]_Intrawell_APW-05/05R	1	214
Barium [ug/L]_Intrawell_APW-05/05R	1	214
Barium [ug/L]_Intrawell_APW-05/05R	1	195
Barium [ug/L]_Intrawell_APW-05/05R	1	187
Barium [ug/L]_Intrawell_APW-05/05R	1	154
Barium [ug/L]_Intrawell_APW-05/05R	1	140
Barium [ug/L]_Intrawell_APW-05/05R	1	145
Barium [ug/L]_Intrawell_APW-05/05R	1	183
Barium [ug/L]_Intrawell_APW-05/05R	1	162
Barium [ug/L]_Intrawell_APW-05/05R	1	225
Barium [ug/L]_Intrawell_APW-05/05R	1	151
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	2
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	1
Beryllium [ug/L]_Intrawell_APW-05/05R	0	2
Boron [mg/L]_Intrawell_APW-05/05R	1	9.3
Boron [mg/L]_Intrawell_APW-05/05R	1	10.3
Boron [mg/L]_Intrawell_APW-05/05R	1	8.89
Boron [mg/L]_Intrawell_APW-05/05R	1	9.98
Boron [mg/L]_Intrawell_APW-05/05R	1	9.1
Boron [mg/L]_Intrawell_APW-05/05R	1	9.83
Boron [mg/L]_Intrawell_APW-05/05R	1	9.25
Boron [mg/L]_Intrawell_APW-05/05R	1	8.73
Boron [mg/L]_Intrawell_APW-05/05R	1	7.67
Boron [mg/L]_Intrawell_APW-05/05R	1	7.76
Boron [mg/L]_Intrawell_APW-05/05R	1	7.48
Boron [mg/L]_Intrawell_APW-05/05R	1	7.35
Boron [mg/L]_Intrawell_APW-05/05R	1	8.76
Boron [mg/L]_Intrawell_APW-05/05R	1	7.12
Boron [mg/L]_Intrawell_APW-05/05R	1	9.62
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Cadmium [ug/L]_Intrawell_APW-05/05R	0	1
Chromium [ug/L]_Intrawell_APW-05/05R	1	13.7
Chromium [ug/L]_Intrawell_APW-05/05R	0	1

group	D_report_result_value	report_result_value
Chromium [ug/L]_Intrawell_APW-05/05R	1	4.1
Chromium [ug/L]_Intrawell_APW-05/05R	0	1
Chromium [ug/L]_Intrawell_APW-05/05R	0	1
Chromium [ug/L]_Intrawell_APW-05/05R	1	8.4
Chromium [ug/L]_Intrawell_APW-05/05R	1	3.3
Chromium [ug/L]_Intrawell_APW-05/05R	0	1
Chromium [ug/L]_Intrawell_APW-05/05R	1	3
Chromium [ug/L]_Intrawell_APW-05/05R	0	1.5
Chromium [ug/L]_Intrawell_APW-05/05R	0	1.5
Chromium [ug/L]_Intrawell_APW-05/05R	0	1.5
Chromium [ug/L]_Intrawell_APW-05/05R	0	1.5
Chromium [ug/L]_Intrawell_APW-05/05R	1	3.1
Chromium [ug/L]_Intrawell_APW-05/05R	1	2
Chromium [ug/L]_Intrawell_APW-05/05R	0	2
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	1	2
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	1
Cobalt [ug/L]_Intrawell_APW-05/05R	0	2
Calcium [mg/L]_Intrawell_APW-05/05R	1	136
Calcium [mg/L]_Intrawell_APW-05/05R	1	142
Calcium [mg/L]_Intrawell_APW-05/05R	1	119
Calcium [mg/L]_Intrawell_APW-05/05R	1	131
Calcium [mg/L]_Intrawell_APW-05/05R	1	123
Calcium [mg/L]_Intrawell_APW-05/05R	1	125
Calcium [mg/L]_Intrawell_APW-05/05R	1	121
Calcium [mg/L]_Intrawell_APW-05/05R	1	124
Calcium [mg/L]_Intrawell_APW-05/05R	1	127
Calcium [mg/L]_Intrawell_APW-05/05R	1	127
Calcium [mg/L]_Intrawell_APW-05/05R	1	117
Calcium [mg/L]_Intrawell_APW-05/05R	1	112
Calcium [mg/L]_Intrawell_APW-05/05R	1	136
Calcium [mg/L]_Intrawell_APW-05/05R	1	105
Calcium [mg/L]_Intrawell_APW-05/05R	1	97.1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	1
Selenium [ug/L]_Intrawell_APW-05/05R	0	2
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	172
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	195
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	201
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	168

group	D_report_result_value	report_result_value
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	193
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	246
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	244
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	249
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	203
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	235
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	223
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	217
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	212
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	223
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	203
Molybdenum [ug/L]_Intrawell_APW-05/05R	1	227
Nickel [ug/L]_Intrawell_APW-05/05R	1	7.4
Nickel [ug/L]_Intrawell_APW-05/05R	1	1.2
Nickel [ug/L]_Intrawell_APW-05/05R	1	2.3
Nickel [ug/L]_Intrawell_APW-05/05R	0	1
Nickel [ug/L]_Intrawell_APW-05/05R	0	1
Nickel [ug/L]_Intrawell_APW-05/05R	1	4.3
Nickel [ug/L]_Intrawell_APW-05/05R	1	2.1
Nickel [ug/L]_Intrawell_APW-05/05R	0	1
Nickel [ug/L]_Intrawell_APW-05/05R	1	3.7
Nickel [ug/L]_Intrawell_APW-05/05R	1	2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Mercury [ug/L]_Intrawell_APW-05/05R	0	0.2
Sulfate [mg/L]_Intrawell_APW-05/05R	1	407
Sulfate [mg/L]_Intrawell_APW-05/05R	1	460
Sulfate [mg/L]_Intrawell_APW-05/05R	1	399
Sulfate [mg/L]_Intrawell_APW-05/05R	1	413
Sulfate [mg/L]_Intrawell_APW-05/05R	1	381
Sulfate [mg/L]_Intrawell_APW-05/05R	1	394
Sulfate [mg/L]_Intrawell_APW-05/05R	1	439
Sulfate [mg/L]_Intrawell_APW-05/05R	1	378
Sulfate [mg/L]_Intrawell_APW-05/05R	1	224
Sulfate [mg/L]_Intrawell_APW-05/05R	1	379
Sulfate [mg/L]_Intrawell_APW-05/05R	1	324
Sulfate [mg/L]_Intrawell_APW-05/05R	1	325
Sulfate [mg/L]_Intrawell_APW-05/05R	1	335
Sulfate [mg/L]_Intrawell_APW-05/05R	1	343
Sulfate [mg/L]_Intrawell_APW-05/05R	1	330
Sulfate [mg/L]_Intrawell_APW-05/05R	1	306
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.37
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.3
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.26
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.3
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.26
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.31
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.23
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.18
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.35
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.55
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.24

group	D_report_result_value	report_result_value
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.31
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.27
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.36
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.33
pH, Lab [SU]_Intrawell_APW-05/05R	1	7.42
Fluoride [ug/L]_Intrawell_APW-05/05R	1	340
Fluoride [ug/L]_Intrawell_APW-05/05R	1	340
Fluoride [ug/L]_Intrawell_APW-05/05R	1	320
Fluoride [ug/L]_Intrawell_APW-05/05R	1	320
Fluoride [ug/L]_Intrawell_APW-05/05R	1	320
Fluoride [ug/L]_Intrawell_APW-05/05R	1	330
Fluoride [ug/L]_Intrawell_APW-05/05R	1	360
Fluoride [ug/L]_Intrawell_APW-05/05R	1	320
Fluoride [ug/L]_Intrawell_APW-05/05R	1	350
Fluoride [ug/L]_Intrawell_APW-05/05R	1	330
Fluoride [ug/L]_Intrawell_APW-05/05R	1	370
Fluoride [ug/L]_Intrawell_APW-05/05R	1	330
Fluoride [ug/L]_Intrawell_APW-05/05R	1	300
Fluoride [ug/L]_Intrawell_APW-05/05R	1	350
Fluoride [ug/L]_Intrawell_APW-05/05R	1	380
Fluoride [ug/L]_Intrawell_APW-05/05R	1	298
Chloride [mg/L]_Intrawell_APW-05/05R	1	15
Chloride [mg/L]_Intrawell_APW-05/05R	1	15
Chloride [mg/L]_Intrawell_APW-05/05R	1	15
Chloride [mg/L]_Intrawell_APW-05/05R	1	14
Chloride [mg/L]_Intrawell_APW-05/05R	1	16
Chloride [mg/L]_Intrawell_APW-05/05R	1	16
Chloride [mg/L]_Intrawell_APW-05/05R	1	16
Chloride [mg/L]_Intrawell_APW-05/05R	1	16
Chloride [mg/L]_Intrawell_APW-05/05R	1	19
Chloride [mg/L]_Intrawell_APW-05/05R	1	15
Chloride [mg/L]_Intrawell_APW-05/05R	1	19
Chloride [mg/L]_Intrawell_APW-05/05R	1	18
Chloride [mg/L]_Intrawell_APW-05/05R	1	17
Chloride [mg/L]_Intrawell_APW-05/05R	1	14
Chloride [mg/L]_Intrawell_APW-05/05R	1	16
Chloride [mg/L]_Intrawell_APW-05/05R	1	16.9
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	3.04
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	1.67
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2.38
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	0.711
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	1.14
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	4.09
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-02	1	0.476
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	858
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	880
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	934
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	916
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	870
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	848
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	836
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	888
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	930
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	890
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	885
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	852
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	920

group	D_report_result_value	report_result_value
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	845
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	920
Dissolved Solids, Total [mg/L]_Intrawell_APW-02	1	820
Lead [ug/L]_Intrawell_APW-02	1	11.5
Lead [ug/L]_Intrawell_APW-02	1	5.4
Lead [ug/L]_Intrawell_APW-02	1	20.1
Lead [ug/L]_Intrawell_APW-02	1	9.6
Lead [ug/L]_Intrawell_APW-02	1	7.5
Lead [ug/L]_Intrawell_APW-02	1	3.1
Lead [ug/L]_Intrawell_APW-02	1	4.8
Lead [ug/L]_Intrawell_APW-02	1	23.9
Lead [ug/L]_Intrawell_APW-02	1	2.2
Lead [ug/L]_Intrawell_APW-02	1	11.9
Lead [ug/L]_Intrawell_APW-02	1	3.3
Lead [ug/L]_Intrawell_APW-02	1	2.7
Lead [ug/L]_Intrawell_APW-02	1	2.5
Lead [ug/L]_Intrawell_APW-02	1	2
Lead [ug/L]_Intrawell_APW-02	1	5.7
Lead [ug/L]_Intrawell_APW-02	1	2.35
Lithium [ug/L]_Intrawell_APW-02	1	50
Lithium [ug/L]_Intrawell_APW-02	1	45.5
Lithium [ug/L]_Intrawell_APW-02	1	64.7
Lithium [ug/L]_Intrawell_APW-02	1	52.1
Lithium [ug/L]_Intrawell_APW-02	1	54.2
Lithium [ug/L]_Intrawell_APW-02	1	47.4
Lithium [ug/L]_Intrawell_APW-02	1	45
Lithium [ug/L]_Intrawell_APW-02	1	60.4
Lithium [ug/L]_Intrawell_APW-02	1	50.7
Lithium [ug/L]_Intrawell_APW-02	1	55.9
Lithium [ug/L]_Intrawell_APW-02	1	38.6
Lithium [ug/L]_Intrawell_APW-02	1	41.7
Lithium [ug/L]_Intrawell_APW-02	1	45.9
Lithium [ug/L]_Intrawell_APW-02	1	42.2
Lithium [ug/L]_Intrawell_APW-02	1	56
Lithium [ug/L]_Intrawell_APW-02	1	41.6
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	1
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Thallium [ug/L]_Intrawell_APW-02	0	2
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	1	2.1
Antimony [ug/L]_Intrawell_APW-02	1	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	1

group	D_report_result_value	report_result_value
Antimony [ug/L]_Intrawell_APW-02	0	1
Antimony [ug/L]_Intrawell_APW-02	0	4
Arsenic [ug/L]_Intrawell_APW-02	1	19.9
Arsenic [ug/L]_Intrawell_APW-02	1	14.7
Arsenic [ug/L]_Intrawell_APW-02	1	21.2
Arsenic [ug/L]_Intrawell_APW-02	1	17
Arsenic [ug/L]_Intrawell_APW-02	1	16.9
Arsenic [ug/L]_Intrawell_APW-02	1	15.7
Arsenic [ug/L]_Intrawell_APW-02	1	14.8
Arsenic [ug/L]_Intrawell_APW-02	1	24.3
Arsenic [ug/L]_Intrawell_APW-02	1	15.8
Arsenic [ug/L]_Intrawell_APW-02	1	26
Arsenic [ug/L]_Intrawell_APW-02	1	22
Arsenic [ug/L]_Intrawell_APW-02	1	18.5
Arsenic [ug/L]_Intrawell_APW-02	1	14.8
Arsenic [ug/L]_Intrawell_APW-02	1	9.3
Arsenic [ug/L]_Intrawell_APW-02	1	23.7
Arsenic [ug/L]_Intrawell_APW-02	1	11.2
Barium [ug/L]_Intrawell_APW-02	1	479
Barium [ug/L]_Intrawell_APW-02	1	355
Barium [ug/L]_Intrawell_APW-02	1	685
Barium [ug/L]_Intrawell_APW-02	1	440
Barium [ug/L]_Intrawell_APW-02	1	427
Barium [ug/L]_Intrawell_APW-02	1	338
Barium [ug/L]_Intrawell_APW-02	1	351
Barium [ug/L]_Intrawell_APW-02	1	739
Barium [ug/L]_Intrawell_APW-02	1	237
Barium [ug/L]_Intrawell_APW-02	1	408
Barium [ug/L]_Intrawell_APW-02	1	254
Barium [ug/L]_Intrawell_APW-02	1	214
Barium [ug/L]_Intrawell_APW-02	1	149
Barium [ug/L]_Intrawell_APW-02	1	152
Barium [ug/L]_Intrawell_APW-02	1	303
Barium [ug/L]_Intrawell_APW-02	1	155
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	1	1.1
Beryllium [ug/L]_Intrawell_APW-02	0	2
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	1
Beryllium [ug/L]_Intrawell_APW-02	0	2
Boron [mg/L]_Intrawell_APW-02	1	8.16
Boron [mg/L]_Intrawell_APW-02	1	8.73
Boron [mg/L]_Intrawell_APW-02	1	8.94
Boron [mg/L]_Intrawell_APW-02	1	9
Boron [mg/L]_Intrawell_APW-02	1	8.98
Boron [mg/L]_Intrawell_APW-02	1	8.39
Boron [mg/L]_Intrawell_APW-02	1	8.19
Boron [mg/L]_Intrawell_APW-02	1	8.24
Boron [mg/L]_Intrawell_APW-02	1	8.13
Boron [mg/L]_Intrawell_APW-02	1	9.43
Boron [mg/L]_Intrawell_APW-02	1	8.97
Boron [mg/L]_Intrawell_APW-02	1	7.75
Boron [mg/L]_Intrawell_APW-02	1	9.14
Boron [mg/L]_Intrawell_APW-02	1	8.24
Boron [mg/L]_Intrawell_APW-02	1	9.62

group	D_report_result_value	report_result_value
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	1	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Cadmium [ug/L]_Intrawell_APW-02	0	1
Chromium [ug/L]_Intrawell_APW-02	1	37.4
Chromium [ug/L]_Intrawell_APW-02	1	45.5
Chromium [ug/L]_Intrawell_APW-02	1	50.3
Chromium [ug/L]_Intrawell_APW-02	1	23.5
Chromium [ug/L]_Intrawell_APW-02	1	14
Chromium [ug/L]_Intrawell_APW-02	1	56.6
Chromium [ug/L]_Intrawell_APW-02	1	127
Chromium [ug/L]_Intrawell_APW-02	1	112
Chromium [ug/L]_Intrawell_APW-02	1	25.4
Chromium [ug/L]_Intrawell_APW-02	1	14.8
Chromium [ug/L]_Intrawell_APW-02	1	6.4
Chromium [ug/L]_Intrawell_APW-02	1	5.2
Chromium [ug/L]_Intrawell_APW-02	1	2.4
Chromium [ug/L]_Intrawell_APW-02	1	8
Chromium [ug/L]_Intrawell_APW-02	1	9.2
Chromium [ug/L]_Intrawell_APW-02	0	2
Cobalt [ug/L]_Intrawell_APW-02	1	5.7
Cobalt [ug/L]_Intrawell_APW-02	1	2.3
Cobalt [ug/L]_Intrawell_APW-02	1	9.7
Cobalt [ug/L]_Intrawell_APW-02	1	4.1
Cobalt [ug/L]_Intrawell_APW-02	1	3.8
Cobalt [ug/L]_Intrawell_APW-02	1	1.8
Cobalt [ug/L]_Intrawell_APW-02	1	2.8
Cobalt [ug/L]_Intrawell_APW-02	1	11
Cobalt [ug/L]_Intrawell_APW-02	1	2
Cobalt [ug/L]_Intrawell_APW-02	1	4.4
Cobalt [ug/L]_Intrawell_APW-02	1	1.5
Cobalt [ug/L]_Intrawell_APW-02	0	1
Cobalt [ug/L]_Intrawell_APW-02	0	1
Cobalt [ug/L]_Intrawell_APW-02	0	1
Cobalt [ug/L]_Intrawell_APW-02	1	2.7
Cobalt [ug/L]_Intrawell_APW-02	0	2
Calcium [mg/L]_Intrawell_APW-02	1	148
Calcium [mg/L]_Intrawell_APW-02	1	145
Calcium [mg/L]_Intrawell_APW-02	1	171
Calcium [mg/L]_Intrawell_APW-02	1	157
Calcium [mg/L]_Intrawell_APW-02	1	158
Calcium [mg/L]_Intrawell_APW-02	1	135
Calcium [mg/L]_Intrawell_APW-02	1	134
Calcium [mg/L]_Intrawell_APW-02	1	175
Calcium [mg/L]_Intrawell_APW-02	1	189
Calcium [mg/L]_Intrawell_APW-02	1	198
Calcium [mg/L]_Intrawell_APW-02	1	145
Calcium [mg/L]_Intrawell_APW-02	1	144
Calcium [mg/L]_Intrawell_APW-02	1	161
Calcium [mg/L]_Intrawell_APW-02	1	132
Calcium [mg/L]_Intrawell_APW-02	1	132
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1

group	D_report_result_value	report_result_value
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	0	1
Selenium [ug/L]_Intrawell_APW-02	1	1.5
Selenium [ug/L]_Intrawell_APW-02	0	2
Molybdenum [ug/L]_Intrawell_APW-02	1	172
Molybdenum [ug/L]_Intrawell_APW-02	1	147
Molybdenum [ug/L]_Intrawell_APW-02	1	214
Molybdenum [ug/L]_Intrawell_APW-02	1	175
Molybdenum [ug/L]_Intrawell_APW-02	1	165
Molybdenum [ug/L]_Intrawell_APW-02	1	111
Molybdenum [ug/L]_Intrawell_APW-02	1	95.1
Molybdenum [ug/L]_Intrawell_APW-02	1	131
Molybdenum [ug/L]_Intrawell_APW-02	1	240
Molybdenum [ug/L]_Intrawell_APW-02	1	174
Molybdenum [ug/L]_Intrawell_APW-02	1	128
Molybdenum [ug/L]_Intrawell_APW-02	1	165
Molybdenum [ug/L]_Intrawell_APW-02	1	229
Molybdenum [ug/L]_Intrawell_APW-02	1	198
Molybdenum [ug/L]_Intrawell_APW-02	1	147
Molybdenum [ug/L]_Intrawell_APW-02	1	158
Nickel [ug/L]_Intrawell_APW-02	1	28.8
Nickel [ug/L]_Intrawell_APW-02	1	26.3
Nickel [ug/L]_Intrawell_APW-02	1	41.2
Nickel [ug/L]_Intrawell_APW-02	1	20.2
Nickel [ug/L]_Intrawell_APW-02	1	13.5
Nickel [ug/L]_Intrawell_APW-02	1	29.5
Nickel [ug/L]_Intrawell_APW-02	1	63.1
Nickel [ug/L]_Intrawell_APW-02	1	72.5
Nickel [ug/L]_Intrawell_APW-02	1	14.2
Nickel [ug/L]_Intrawell_APW-02	1	4.5
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	1	0.43
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Mercury [ug/L]_Intrawell_APW-02	0	0.2
Sulfate [mg/L]_Intrawell_APW-02	1	462
Sulfate [mg/L]_Intrawell_APW-02	1	460
Sulfate [mg/L]_Intrawell_APW-02	1	472
Sulfate [mg/L]_Intrawell_APW-02	1	479
Sulfate [mg/L]_Intrawell_APW-02	1	472
Sulfate [mg/L]_Intrawell_APW-02	1	426
Sulfate [mg/L]_Intrawell_APW-02	1	443
Sulfate [mg/L]_Intrawell_APW-02	1	416
Sulfate [mg/L]_Intrawell_APW-02	1	496

group	D_report_result_value	report_result_value
Sulfate [mg/L]_Intrawell_APW-02	1	491
Sulfate [mg/L]_Intrawell_APW-02	1	418
Sulfate [mg/L]_Intrawell_APW-02	1	459
Sulfate [mg/L]_Intrawell_APW-02	1	500
Sulfate [mg/L]_Intrawell_APW-02	1	460
Sulfate [mg/L]_Intrawell_APW-02	1	440
Sulfate [mg/L]_Intrawell_APW-02	1	411
pH, Lab [SU]_Intrawell_APW-02	1	7.09
pH, Lab [SU]_Intrawell_APW-02	1	7.05
pH, Lab [SU]_Intrawell_APW-02	1	7.08
pH, Lab [SU]_Intrawell_APW-02	1	7.07
pH, Lab [SU]_Intrawell_APW-02	1	7.05
pH, Lab [SU]_Intrawell_APW-02	1	7.14
pH, Lab [SU]_Intrawell_APW-02	1	7.06
pH, Lab [SU]_Intrawell_APW-02	1	6.96
pH, Lab [SU]_Intrawell_APW-02	1	7.21
pH, Lab [SU]_Intrawell_APW-02	1	7.32
pH, Lab [SU]_Intrawell_APW-02	1	7.01
pH, Lab [SU]_Intrawell_APW-02	1	6.98
pH, Lab [SU]_Intrawell_APW-02	1	6.9
pH, Lab [SU]_Intrawell_APW-02	1	7.15
pH, Lab [SU]_Intrawell_APW-02	1	7.11
pH, Lab [SU]_Intrawell_APW-02	1	7.52
Fluoride [ug/L]_Intrawell_APW-02	1	240
Fluoride [ug/L]_Intrawell_APW-02	1	260
Fluoride [ug/L]_Intrawell_APW-02	1	250
Fluoride [ug/L]_Intrawell_APW-02	1	240
Fluoride [ug/L]_Intrawell_APW-02	1	240
Fluoride [ug/L]_Intrawell_APW-02	1	250
Fluoride [ug/L]_Intrawell_APW-02	1	260
Fluoride [ug/L]_Intrawell_APW-02	1	240
Fluoride [ug/L]_Intrawell_APW-02	1	250
Fluoride [ug/L]_Intrawell_APW-02	1	220
Fluoride [ug/L]_Intrawell_APW-02	1	250
Fluoride [ug/L]_Intrawell_APW-02	1	230
Fluoride [ug/L]_Intrawell_APW-02	1	220
Fluoride [ug/L]_Intrawell_APW-02	1	240
Fluoride [ug/L]_Intrawell_APW-02	1	260
Fluoride [ug/L]_Intrawell_APW-02	1	230
Chloride [mg/L]_Intrawell_APW-02	1	13
Chloride [mg/L]_Intrawell_APW-02	1	12
Chloride [mg/L]_Intrawell_APW-02	1	11
Chloride [mg/L]_Intrawell_APW-02	1	11
Chloride [mg/L]_Intrawell_APW-02	1	12
Chloride [mg/L]_Intrawell_APW-02	1	12
Chloride [mg/L]_Intrawell_APW-02	1	12
Chloride [mg/L]_Intrawell_APW-02	1	12
Chloride [mg/L]_Intrawell_APW-02	1	9
Chloride [mg/L]_Intrawell_APW-02	1	11
Chloride [mg/L]_Intrawell_APW-02	1	9
Chloride [mg/L]_Intrawell_APW-02	1	10
Chloride [mg/L]_Intrawell_APW-02	1	7
Chloride [mg/L]_Intrawell_APW-02	1	7
Chloride [mg/L]_Intrawell_APW-02	1	8
Chloride [mg/L]_Intrawell_APW-02	1	7.78
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	1.77
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2

group	D_report_result_value	report_result_value
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	1.38
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2.8
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06D	1	1.82
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	558
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	560
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	562
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	564
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	590
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	482
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	584
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	670
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	580
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	582
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	735
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	565
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	560
Dissolved Solids, Total [mg/L]_Intrawell_APW-06D	1	536
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	1	1.2
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	1	1.6
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	1
Lead [ug/L]_Intrawell_APW-06D	0	2
Lithium [ug/L]_Intrawell_APW-06D	1	16
Lithium [ug/L]_Intrawell_APW-06D	1	17.6
Lithium [ug/L]_Intrawell_APW-06D	1	16.1
Lithium [ug/L]_Intrawell_APW-06D	1	16.3
Lithium [ug/L]_Intrawell_APW-06D	1	17.8
Lithium [ug/L]_Intrawell_APW-06D	1	18.1
Lithium [ug/L]_Intrawell_APW-06D	1	16.5
Lithium [ug/L]_Intrawell_APW-06D	1	16.2
Lithium [ug/L]_Intrawell_APW-06D	1	18.5
Lithium [ug/L]_Intrawell_APW-06D	1	17.5
Lithium [ug/L]_Intrawell_APW-06D	1	17.2
Lithium [ug/L]_Intrawell_APW-06D	1	18.4
Lithium [ug/L]_Intrawell_APW-06D	1	16.9
Lithium [ug/L]_Intrawell_APW-06D	1	19.9
Lithium [ug/L]_Intrawell_APW-06D	1	17.3
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	1
Thallium [ug/L]_Intrawell_APW-06D	0	2
Thallium [ug/L]_Intrawell_APW-06D	0	2
Thallium [ug/L]_Intrawell_APW-06D	0	2
Thallium [ug/L]_Intrawell_APW-06D	0	2
Thallium [ug/L]_Intrawell_APW-06D	0	2
Thallium [ug/L]_Intrawell_APW-06D	0	2
Thallium [ug/L]_Intrawell_APW-06D	0	2
Antimony [ug/L]_Intrawell_APW-06D	0	1

group	D_report_result_value	report_result_value
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	1
Antimony [ug/L]_Intrawell_APW-06D	0	4
Arsenic [ug/L]_Intrawell_APW-06D	1	6.8
Arsenic [ug/L]_Intrawell_APW-06D	1	10.1
Arsenic [ug/L]_Intrawell_APW-06D	1	7.5
Arsenic [ug/L]_Intrawell_APW-06D	1	7.4
Arsenic [ug/L]_Intrawell_APW-06D	1	9
Arsenic [ug/L]_Intrawell_APW-06D	1	9.5
Arsenic [ug/L]_Intrawell_APW-06D	1	10.6
Arsenic [ug/L]_Intrawell_APW-06D	1	9.6
Arsenic [ug/L]_Intrawell_APW-06D	1	10.4
Arsenic [ug/L]_Intrawell_APW-06D	1	11.1
Arsenic [ug/L]_Intrawell_APW-06D	1	10.7
Arsenic [ug/L]_Intrawell_APW-06D	1	11.5
Arsenic [ug/L]_Intrawell_APW-06D	1	10.9
Arsenic [ug/L]_Intrawell_APW-06D	1	13.5
Arsenic [ug/L]_Intrawell_APW-06D	1	10.2
Barium [ug/L]_Intrawell_APW-06D	1	173
Barium [ug/L]_Intrawell_APW-06D	1	172
Barium [ug/L]_Intrawell_APW-06D	1	142
Barium [ug/L]_Intrawell_APW-06D	1	153
Barium [ug/L]_Intrawell_APW-06D	1	155
Barium [ug/L]_Intrawell_APW-06D	1	163
Barium [ug/L]_Intrawell_APW-06D	1	166
Barium [ug/L]_Intrawell_APW-06D	1	148
Barium [ug/L]_Intrawell_APW-06D	1	143
Barium [ug/L]_Intrawell_APW-06D	1	142
Barium [ug/L]_Intrawell_APW-06D	1	134
Barium [ug/L]_Intrawell_APW-06D	1	145
Barium [ug/L]_Intrawell_APW-06D	1	128
Barium [ug/L]_Intrawell_APW-06D	1	151
Barium [ug/L]_Intrawell_APW-06D	1	115
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	1
Beryllium [ug/L]_Intrawell_APW-06D	0	2
Boron [mg/L]_Intrawell_APW-06D	1	3.72
Boron [mg/L]_Intrawell_APW-06D	1	3.87
Boron [mg/L]_Intrawell_APW-06D	1	3.55
Boron [mg/L]_Intrawell_APW-06D	1	3.58
Boron [mg/L]_Intrawell_APW-06D	1	3.9
Boron [mg/L]_Intrawell_APW-06D	1	3.84

group	D_report_result_value	report_result_value
Boron [mg/L]_Intrawell_APW-06D	1	3.3
Boron [mg/L]_Intrawell_APW-06D	1	3.09
Boron [mg/L]_Intrawell_APW-06D	1	5.51
Boron [mg/L]_Intrawell_APW-06D	1	4.29
Boron [mg/L]_Intrawell_APW-06D	1	3.95
Boron [mg/L]_Intrawell_APW-06D	1	4.99
Boron [mg/L]_Intrawell_APW-06D	1	3.81
Boron [mg/L]_Intrawell_APW-06D	1	3.8
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Cadmium [ug/L]_Intrawell_APW-06D	0	1
Chromium [ug/L]_Intrawell_APW-06D	0	1
Chromium [ug/L]_Intrawell_APW-06D	1	1.3
Chromium [ug/L]_Intrawell_APW-06D	0	1
Chromium [ug/L]_Intrawell_APW-06D	0	1
Chromium [ug/L]_Intrawell_APW-06D	0	1
Chromium [ug/L]_Intrawell_APW-06D	1	1.7
Chromium [ug/L]_Intrawell_APW-06D	1	3
Chromium [ug/L]_Intrawell_APW-06D	1	1.4
Chromium [ug/L]_Intrawell_APW-06D	0	1.5
Chromium [ug/L]_Intrawell_APW-06D	1	6.3
Chromium [ug/L]_Intrawell_APW-06D	0	1.5
Chromium [ug/L]_Intrawell_APW-06D	1	5.7
Chromium [ug/L]_Intrawell_APW-06D	1	72.7
Chromium [ug/L]_Intrawell_APW-06D	0	1.5
Chromium [ug/L]_Intrawell_APW-06D	1	8.61
Cobalt [ug/L]_Intrawell_APW-06D	1	1.2
Cobalt [ug/L]_Intrawell_APW-06D	1	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	0	1
Cobalt [ug/L]_Intrawell_APW-06D	1	3.5
Cobalt [ug/L]_Intrawell_APW-06D	1	1.3
Cobalt [ug/L]_Intrawell_APW-06D	1	5.4
Cobalt [ug/L]_Intrawell_APW-06D	1	3.5
Cobalt [ug/L]_Intrawell_APW-06D	1	1.3
Cobalt [ug/L]_Intrawell_APW-06D	0	2
Calcium [mg/L]_Intrawell_APW-06D	1	99.9
Calcium [mg/L]_Intrawell_APW-06D	1	110
Calcium [mg/L]_Intrawell_APW-06D	1	96.7
Calcium [mg/L]_Intrawell_APW-06D	1	100
Calcium [mg/L]_Intrawell_APW-06D	1	110
Calcium [mg/L]_Intrawell_APW-06D	1	107
Calcium [mg/L]_Intrawell_APW-06D	1	105
Calcium [mg/L]_Intrawell_APW-06D	1	105
Calcium [mg/L]_Intrawell_APW-06D	1	123
Calcium [mg/L]_Intrawell_APW-06D	1	110
Calcium [mg/L]_Intrawell_APW-06D	1	116
Calcium [mg/L]_Intrawell_APW-06D	1	128

group	D_report_result_value	report_result_value
Calcium [mg/L]_Intrawell_APW-06D	1	106
Calcium [mg/L]_Intrawell_APW-06D	1	98.4
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	1
Selenium [ug/L]_Intrawell_APW-06D	0	2
Molybdenum [ug/L]_Intrawell_APW-06D	1	64.6
Molybdenum [ug/L]_Intrawell_APW-06D	1	60.6
Molybdenum [ug/L]_Intrawell_APW-06D	1	58.2
Molybdenum [ug/L]_Intrawell_APW-06D	1	58.9
Molybdenum [ug/L]_Intrawell_APW-06D	1	60
Molybdenum [ug/L]_Intrawell_APW-06D	1	58.4
Molybdenum [ug/L]_Intrawell_APW-06D	1	46.5
Molybdenum [ug/L]_Intrawell_APW-06D	1	46.3
Molybdenum [ug/L]_Intrawell_APW-06D	1	71.9
Molybdenum [ug/L]_Intrawell_APW-06D	1	69.6
Molybdenum [ug/L]_Intrawell_APW-06D	1	68.3
Molybdenum [ug/L]_Intrawell_APW-06D	1	60.2
Molybdenum [ug/L]_Intrawell_APW-06D	1	67.2
Molybdenum [ug/L]_Intrawell_APW-06D	1	55.7
Molybdenum [ug/L]_Intrawell_APW-06D	1	60.5
Nickel [ug/L]_Intrawell_APW-06D	1	3.2
Nickel [ug/L]_Intrawell_APW-06D	1	2.8
Nickel [ug/L]_Intrawell_APW-06D	1	1.8
Nickel [ug/L]_Intrawell_APW-06D	1	2
Nickel [ug/L]_Intrawell_APW-06D	1	1.7
Nickel [ug/L]_Intrawell_APW-06D	1	2.2
Nickel [ug/L]_Intrawell_APW-06D	1	3.2
Nickel [ug/L]_Intrawell_APW-06D	1	2.5
Nickel [ug/L]_Intrawell_APW-06D	1	9.3
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Mercury [ug/L]_Intrawell_APW-06D	0	0.2
Sulfate [mg/L]_Intrawell_APW-06D	1	215
Sulfate [mg/L]_Intrawell_APW-06D	1	228
Sulfate [mg/L]_Intrawell_APW-06D	1	206
Sulfate [mg/L]_Intrawell_APW-06D	1	222
Sulfate [mg/L]_Intrawell_APW-06D	1	230
Sulfate [mg/L]_Intrawell_APW-06D	1	236
Sulfate [mg/L]_Intrawell_APW-06D	1	211
Sulfate [mg/L]_Intrawell_APW-06D	1	189
Sulfate [mg/L]_Intrawell_APW-06D	1	272

group	D_report_result_value	report_result_value
Sulfate [mg/L]_Intrawell_APW-06D	1	254
Sulfate [mg/L]_Intrawell_APW-06D	1	269
Sulfate [mg/L]_Intrawell_APW-06D	1	270
Sulfate [mg/L]_Intrawell_APW-06D	1	218
Sulfate [mg/L]_Intrawell_APW-06D	1	184
Sulfate [mg/L]_Intrawell_APW-06D	1	180
pH, Lab [SU]_Intrawell_APW-06D	1	7.23
pH, Lab [SU]_Intrawell_APW-06D	1	7.25
pH, Lab [SU]_Intrawell_APW-06D	1	7.23
pH, Lab [SU]_Intrawell_APW-06D	1	7.19
pH, Lab [SU]_Intrawell_APW-06D	1	7.2
pH, Lab [SU]_Intrawell_APW-06D	1	7.22
pH, Lab [SU]_Intrawell_APW-06D	1	7.21
pH, Lab [SU]_Intrawell_APW-06D	1	7.2
pH, Lab [SU]_Intrawell_APW-06D	1	7.42
pH, Lab [SU]_Intrawell_APW-06D	1	7.21
pH, Lab [SU]_Intrawell_APW-06D	1	7.29
pH, Lab [SU]_Intrawell_APW-06D	1	7.39
pH, Lab [SU]_Intrawell_APW-06D	1	7.3
pH, Lab [SU]_Intrawell_APW-06D	1	7.36
pH, Lab [SU]_Intrawell_APW-06D	1	7.73
Fluoride [ug/L]_Intrawell_APW-06D	1	220
Fluoride [ug/L]_Intrawell_APW-06D	1	230
Fluoride [ug/L]_Intrawell_APW-06D	1	210
Fluoride [ug/L]_Intrawell_APW-06D	1	220
Fluoride [ug/L]_Intrawell_APW-06D	1	210
Fluoride [ug/L]_Intrawell_APW-06D	1	220
Fluoride [ug/L]_Intrawell_APW-06D	1	230
Fluoride [ug/L]_Intrawell_APW-06D	1	210
Fluoride [ug/L]_Intrawell_APW-06D	1	200
Fluoride [ug/L]_Intrawell_APW-06D	1	240
Fluoride [ug/L]_Intrawell_APW-06D	1	210
Fluoride [ug/L]_Intrawell_APW-06D	1	200
Fluoride [ug/L]_Intrawell_APW-06D	1	220
Fluoride [ug/L]_Intrawell_APW-06D	1	240
Fluoride [ug/L]_Intrawell_APW-06D	1	212
Chloride [mg/L]_Intrawell_APW-06D	1	17
Chloride [mg/L]_Intrawell_APW-06D	1	17
Chloride [mg/L]_Intrawell_APW-06D	1	16
Chloride [mg/L]_Intrawell_APW-06D	1	16
Chloride [mg/L]_Intrawell_APW-06D	1	16
Chloride [mg/L]_Intrawell_APW-06D	1	16
Chloride [mg/L]_Intrawell_APW-06D	1	17
Chloride [mg/L]_Intrawell_APW-06D	1	17
Chloride [mg/L]_Intrawell_APW-06D	1	14
Chloride [mg/L]_Intrawell_APW-06D	1	17
Chloride [mg/L]_Intrawell_APW-06D	1	16
Chloride [mg/L]_Intrawell_APW-06D	1	15
Chloride [mg/L]_Intrawell_APW-06D	1	16
Chloride [mg/L]_Intrawell_APW-06D	1	22
Chloride [mg/L]_Intrawell_APW-06D	1	21.2
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	500
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	546
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	574
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	528
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	566
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	588
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	598
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	666
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	600
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	630
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	605
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	638
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	615
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	565

group	D_report_result_value	report_result_value
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	635
Dissolved Solids, Total [mg/L]_Intrawell_APW-06S	1	644
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	1	2.8
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	1
Lead [ug/L]_Intrawell_APW-06S	0	2
Lithium [ug/L]_Intrawell_APW-06S	1	33.5
Lithium [ug/L]_Intrawell_APW-06S	1	41.3
Lithium [ug/L]_Intrawell_APW-06S	1	40
Lithium [ug/L]_Intrawell_APW-06S	1	41.5
Lithium [ug/L]_Intrawell_APW-06S	1	42
Lithium [ug/L]_Intrawell_APW-06S	1	45.8
Lithium [ug/L]_Intrawell_APW-06S	1	45.1
Lithium [ug/L]_Intrawell_APW-06S	1	41.7
Lithium [ug/L]_Intrawell_APW-06S	1	36.3
Lithium [ug/L]_Intrawell_APW-06S	1	41
Lithium [ug/L]_Intrawell_APW-06S	1	39.3
Lithium [ug/L]_Intrawell_APW-06S	1	40.6
Lithium [ug/L]_Intrawell_APW-06S	1	41.2
Lithium [ug/L]_Intrawell_APW-06S	1	36.9
Lithium [ug/L]_Intrawell_APW-06S	1	56.4
Lithium [ug/L]_Intrawell_APW-06S	1	42.1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	1
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Thallium [ug/L]_Intrawell_APW-06S	0	2
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1
Antimony [ug/L]_Intrawell_APW-06S	0	1

group	D_report_result_value	report_result_value
Antimony [ug/L]_Intrawell_APW-06S	0	4
Arsenic [ug/L]_Intrawell_APW-06S	1	1.7
Arsenic [ug/L]_Intrawell_APW-06S	1	1.6
Arsenic [ug/L]_Intrawell_APW-06S	1	1.8
Arsenic [ug/L]_Intrawell_APW-06S	1	2
Arsenic [ug/L]_Intrawell_APW-06S	1	1.3
Arsenic [ug/L]_Intrawell_APW-06S	1	1.2
Arsenic [ug/L]_Intrawell_APW-06S	1	1.1
Arsenic [ug/L]_Intrawell_APW-06S	1	1.1
Arsenic [ug/L]_Intrawell_APW-06S	1	1
Arsenic [ug/L]_Intrawell_APW-06S	1	1.2
Arsenic [ug/L]_Intrawell_APW-06S	1	1
Arsenic [ug/L]_Intrawell_APW-06S	1	1.1
Arsenic [ug/L]_Intrawell_APW-06S	0	1
Arsenic [ug/L]_Intrawell_APW-06S	1	1.2
Arsenic [ug/L]_Intrawell_APW-06S	1	1.6
Arsenic [ug/L]_Intrawell_APW-06S	0	2
Barium [ug/L]_Intrawell_APW-06S	1	222
Barium [ug/L]_Intrawell_APW-06S	1	237
Barium [ug/L]_Intrawell_APW-06S	1	205
Barium [ug/L]_Intrawell_APW-06S	1	226
Barium [ug/L]_Intrawell_APW-06S	1	214
Barium [ug/L]_Intrawell_APW-06S	1	213
Barium [ug/L]_Intrawell_APW-06S	1	224
Barium [ug/L]_Intrawell_APW-06S	1	205
Barium [ug/L]_Intrawell_APW-06S	1	250
Barium [ug/L]_Intrawell_APW-06S	1	221
Barium [ug/L]_Intrawell_APW-06S	1	190
Barium [ug/L]_Intrawell_APW-06S	1	202
Barium [ug/L]_Intrawell_APW-06S	1	224
Barium [ug/L]_Intrawell_APW-06S	1	206
Barium [ug/L]_Intrawell_APW-06S	1	305
Barium [ug/L]_Intrawell_APW-06S	1	204
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	1
Beryllium [ug/L]_Intrawell_APW-06S	0	2
Boron [mg/L]_Intrawell_APW-06S	1	4.65
Boron [mg/L]_Intrawell_APW-06S	1	5.93
Boron [mg/L]_Intrawell_APW-06S	1	5.83
Boron [mg/L]_Intrawell_APW-06S	1	5.64
Boron [mg/L]_Intrawell_APW-06S	1	5.8
Boron [mg/L]_Intrawell_APW-06S	1	6.93
Boron [mg/L]_Intrawell_APW-06S	1	7.42
Boron [mg/L]_Intrawell_APW-06S	1	6.66
Boron [mg/L]_Intrawell_APW-06S	1	4.77
Boron [mg/L]_Intrawell_APW-06S	1	6.61
Boron [mg/L]_Intrawell_APW-06S	1	6.31
Boron [mg/L]_Intrawell_APW-06S	1	6.84
Boron [mg/L]_Intrawell_APW-06S	1	5.84
Boron [mg/L]_Intrawell_APW-06S	1	5.79
Boron [mg/L]_Intrawell_APW-06S	1	9.19
Cadmium [ug/L]_Intrawell_APW-06S	0	1

group	D_report_result_value	report_result_value
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Cadmium [ug/L]_Intrawell_APW-06S	0	1
Chromium [ug/L]_Intrawell_APW-06S	1	2.7
Chromium [ug/L]_Intrawell_APW-06S	1	17.3
Chromium [ug/L]_Intrawell_APW-06S	1	2.8
Chromium [ug/L]_Intrawell_APW-06S	0	1
Chromium [ug/L]_Intrawell_APW-06S	0	1
Chromium [ug/L]_Intrawell_APW-06S	1	4.8
Chromium [ug/L]_Intrawell_APW-06S	1	1.2
Chromium [ug/L]_Intrawell_APW-06S	0	1
Chromium [ug/L]_Intrawell_APW-06S	1	2.8
Chromium [ug/L]_Intrawell_APW-06S	0	1.5
Chromium [ug/L]_Intrawell_APW-06S	1	2.2
Chromium [ug/L]_Intrawell_APW-06S	0	1.5
Chromium [ug/L]_Intrawell_APW-06S	1	1.9
Chromium [ug/L]_Intrawell_APW-06S	1	6.7
Chromium [ug/L]_Intrawell_APW-06S	0	1.5
Chromium [ug/L]_Intrawell_APW-06S	0	2
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	1	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	1
Cobalt [ug/L]_Intrawell_APW-06S	0	2
Calcium [mg/L]_Intrawell_APW-06S	1	101
Calcium [mg/L]_Intrawell_APW-06S	1	97.2
Calcium [mg/L]_Intrawell_APW-06S	1	87.5
Calcium [mg/L]_Intrawell_APW-06S	1	96.8
Calcium [mg/L]_Intrawell_APW-06S	1	99.5
Calcium [mg/L]_Intrawell_APW-06S	1	98.1
Calcium [mg/L]_Intrawell_APW-06S	1	98.7
Calcium [mg/L]_Intrawell_APW-06S	1	97.4
Calcium [mg/L]_Intrawell_APW-06S	1	115
Calcium [mg/L]_Intrawell_APW-06S	1	105
Calcium [mg/L]_Intrawell_APW-06S	1	103
Calcium [mg/L]_Intrawell_APW-06S	1	97.1
Calcium [mg/L]_Intrawell_APW-06S	1	109
Calcium [mg/L]_Intrawell_APW-06S	1	92.7
Calcium [mg/L]_Intrawell_APW-06S	1	90
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1

group	D_report_result_value	report_result_value
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	1
Selenium [ug/L]_Intrawell_APW-06S	0	2
Molybdenum [ug/L]_Intrawell_APW-06S	1	249
Molybdenum [ug/L]_Intrawell_APW-06S	1	287
Molybdenum [ug/L]_Intrawell_APW-06S	1	272
Molybdenum [ug/L]_Intrawell_APW-06S	1	243
Molybdenum [ug/L]_Intrawell_APW-06S	1	274
Molybdenum [ug/L]_Intrawell_APW-06S	1	314
Molybdenum [ug/L]_Intrawell_APW-06S	1	324
Molybdenum [ug/L]_Intrawell_APW-06S	1	323
Molybdenum [ug/L]_Intrawell_APW-06S	1	237
Molybdenum [ug/L]_Intrawell_APW-06S	1	271
Molybdenum [ug/L]_Intrawell_APW-06S	1	259
Molybdenum [ug/L]_Intrawell_APW-06S	1	265
Molybdenum [ug/L]_Intrawell_APW-06S	1	235
Molybdenum [ug/L]_Intrawell_APW-06S	1	225
Molybdenum [ug/L]_Intrawell_APW-06S	1	207
Molybdenum [ug/L]_Intrawell_APW-06S	1	255
Nickel [ug/L]_Intrawell_APW-06S	1	2.1
Nickel [ug/L]_Intrawell_APW-06S	1	9
Nickel [ug/L]_Intrawell_APW-06S	1	2.1
Nickel [ug/L]_Intrawell_APW-06S	1	1.2
Nickel [ug/L]_Intrawell_APW-06S	0	1
Nickel [ug/L]_Intrawell_APW-06S	1	3.1
Nickel [ug/L]_Intrawell_APW-06S	1	1.6
Nickel [ug/L]_Intrawell_APW-06S	1	1.2
Nickel [ug/L]_Intrawell_APW-06S	1	2.7
Nickel [ug/L]_Intrawell_APW-06S	1	2.3
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Mercury [ug/L]_Intrawell_APW-06S	0	0.2
Sulfate [mg/L]_Intrawell_APW-06S	1	127
Sulfate [mg/L]_Intrawell_APW-06S	1	177
Sulfate [mg/L]_Intrawell_APW-06S	1	167
Sulfate [mg/L]_Intrawell_APW-06S	1	151
Sulfate [mg/L]_Intrawell_APW-06S	1	189
Sulfate [mg/L]_Intrawell_APW-06S	1	201
Sulfate [mg/L]_Intrawell_APW-06S	1	233
Sulfate [mg/L]_Intrawell_APW-06S	1	220
Sulfate [mg/L]_Intrawell_APW-06S	1	200
Sulfate [mg/L]_Intrawell_APW-06S	1	227

group	D_report_result_value	report_result_value
Sulfate [mg/L]_Intrawell_APW-06S	1	243
Sulfate [mg/L]_Intrawell_APW-06S	1	247
Sulfate [mg/L]_Intrawell_APW-06S	1	208
Sulfate [mg/L]_Intrawell_APW-06S	1	221
Sulfate [mg/L]_Intrawell_APW-06S	1	237
Sulfate [mg/L]_Intrawell_APW-06S	1	240
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	1.07
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	0.497
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2.93
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	1.47
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-06S	1	1.93
pH, Lab [SU]_Intrawell_APW-06S	1	7.16
pH, Lab [SU]_Intrawell_APW-06S	1	7.06
pH, Lab [SU]_Intrawell_APW-06S	1	7.18
pH, Lab [SU]_Intrawell_APW-06S	1	7.23
pH, Lab [SU]_Intrawell_APW-06S	1	7.09
pH, Lab [SU]_Intrawell_APW-06S	1	7.13
pH, Lab [SU]_Intrawell_APW-06S	1	7.09
pH, Lab [SU]_Intrawell_APW-06S	1	7.02
pH, Lab [SU]_Intrawell_APW-06S	1	7.24
pH, Lab [SU]_Intrawell_APW-06S	1	7.38
pH, Lab [SU]_Intrawell_APW-06S	1	7.04
pH, Lab [SU]_Intrawell_APW-06S	1	7.12
pH, Lab [SU]_Intrawell_APW-06S	1	7.05
pH, Lab [SU]_Intrawell_APW-06S	1	7.21
pH, Lab [SU]_Intrawell_APW-06S	1	7.12
pH, Lab [SU]_Intrawell_APW-06S	1	7.67
Fluoride [ug/L]_Intrawell_APW-06S	1	410
Fluoride [ug/L]_Intrawell_APW-06S	1	260
Fluoride [ug/L]_Intrawell_APW-06S	1	250
Fluoride [ug/L]_Intrawell_APW-06S	1	260
Fluoride [ug/L]_Intrawell_APW-06S	1	250
Fluoride [ug/L]_Intrawell_APW-06S	1	250
Fluoride [ug/L]_Intrawell_APW-06S	1	270
Fluoride [ug/L]_Intrawell_APW-06S	1	240
Fluoride [ug/L]_Intrawell_APW-06S	1	290
Fluoride [ug/L]_Intrawell_APW-06S	1	280
Fluoride [ug/L]_Intrawell_APW-06S	1	320
Fluoride [ug/L]_Intrawell_APW-06S	1	290
Fluoride [ug/L]_Intrawell_APW-06S	1	260
Fluoride [ug/L]_Intrawell_APW-06S	1	300
Fluoride [ug/L]_Intrawell_APW-06S	1	330
Fluoride [ug/L]_Intrawell_APW-06S	1	277
Chloride [mg/L]_Intrawell_APW-06S	1	31
Chloride [mg/L]_Intrawell_APW-06S	1	28
Chloride [mg/L]_Intrawell_APW-06S	1	27
Chloride [mg/L]_Intrawell_APW-06S	1	27
Chloride [mg/L]_Intrawell_APW-06S	1	26
Chloride [mg/L]_Intrawell_APW-06S	1	27
Chloride [mg/L]_Intrawell_APW-06S	1	26
Chloride [mg/L]_Intrawell_APW-06S	1	25
Chloride [mg/L]_Intrawell_APW-06S	1	24
Chloride [mg/L]_Intrawell_APW-06S	1	25
Chloride [mg/L]_Intrawell_APW-06S	1	24

group	D_report_result_value	report_result_value
Chloride [mg/L]_Intrawell_APW-06S	1	24
Chloride [mg/L]_Intrawell_APW-06S	1	23
Chloride [mg/L]_Intrawell_APW-06S	1	20
Chloride [mg/L]_Intrawell_APW-06S	1	22
Chloride [mg/L]_Intrawell_APW-06S	1	21.2
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	466
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	474
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	442
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	468
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	482
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	448
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	448
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	512
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	452
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	460
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	460
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	454
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	485
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	468
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	445
Dissolved Solids, Total [mg/L]_Intrawell_APW-10D	1	436
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	1	1
Lead [ug/L]_Intrawell_APW-10D	1	2
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	1
Lead [ug/L]_Intrawell_APW-10D	0	2
Lithium [ug/L]_Intrawell_APW-10D	1	14.7
Lithium [ug/L]_Intrawell_APW-10D	1	15.5
Lithium [ug/L]_Intrawell_APW-10D	1	14.6
Lithium [ug/L]_Intrawell_APW-10D	1	14.6
Lithium [ug/L]_Intrawell_APW-10D	1	15.3
Lithium [ug/L]_Intrawell_APW-10D	1	15.5
Lithium [ug/L]_Intrawell_APW-10D	1	14.2
Lithium [ug/L]_Intrawell_APW-10D	1	14
Lithium [ug/L]_Intrawell_APW-10D	1	18
Lithium [ug/L]_Intrawell_APW-10D	1	15.6
Lithium [ug/L]_Intrawell_APW-10D	1	12.6
Lithium [ug/L]_Intrawell_APW-10D	1	14.6
Lithium [ug/L]_Intrawell_APW-10D	1	15.8
Lithium [ug/L]_Intrawell_APW-10D	1	14.8
Lithium [ug/L]_Intrawell_APW-10D	1	15.4
Lithium [ug/L]_Intrawell_APW-10D	1	15.2
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	1
Thallium [ug/L]_Intrawell_APW-10D	0	2
Thallium [ug/L]_Intrawell_APW-10D	0	2
Thallium [ug/L]_Intrawell_APW-10D	0	2
Thallium [ug/L]_Intrawell_APW-10D	0	2

group	D_report_result_value	report_result_value
Thallium [ug/L]_Intrawell_APW-10D	0	2
Thallium [ug/L]_Intrawell_APW-10D	0	2
Thallium [ug/L]_Intrawell_APW-10D	0	2
Thallium [ug/L]_Intrawell_APW-10D	0	2
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	1
Antimony [ug/L]_Intrawell_APW-10D	0	4
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	1	1
Arsenic [ug/L]_Intrawell_APW-10D	0	1
Arsenic [ug/L]_Intrawell_APW-10D	1	1.7
Arsenic [ug/L]_Intrawell_APW-10D	1	5.7
Arsenic [ug/L]_Intrawell_APW-10D	1	1.4
Arsenic [ug/L]_Intrawell_APW-10D	1	1.7
Arsenic [ug/L]_Intrawell_APW-10D	1	1.9
Arsenic [ug/L]_Intrawell_APW-10D	1	1.6
Arsenic [ug/L]_Intrawell_APW-10D	1	2.1
Arsenic [ug/L]_Intrawell_APW-10D	0	2
Barium [ug/L]_Intrawell_APW-10D	1	437
Barium [ug/L]_Intrawell_APW-10D	1	304
Barium [ug/L]_Intrawell_APW-10D	1	363
Barium [ug/L]_Intrawell_APW-10D	1	325
Barium [ug/L]_Intrawell_APW-10D	1	284
Barium [ug/L]_Intrawell_APW-10D	1	295
Barium [ug/L]_Intrawell_APW-10D	1	391
Barium [ug/L]_Intrawell_APW-10D	1	357
Barium [ug/L]_Intrawell_APW-10D	1	407
Barium [ug/L]_Intrawell_APW-10D	1	418
Barium [ug/L]_Intrawell_APW-10D	1	276
Barium [ug/L]_Intrawell_APW-10D	1	343
Barium [ug/L]_Intrawell_APW-10D	1	485
Barium [ug/L]_Intrawell_APW-10D	1	339
Barium [ug/L]_Intrawell_APW-10D	1	398
Barium [ug/L]_Intrawell_APW-10D	1	341
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1

group	D_report_result_value	report_result_value
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	1
Beryllium [ug/L]_Intrawell_APW-10D	0	2
Boron [mg/L]_Intrawell_APW-10D	1	0.0999
Boron [mg/L]_Intrawell_APW-10D	1	0.101
Boron [mg/L]_Intrawell_APW-10D	1	0.0843
Boron [mg/L]_Intrawell_APW-10D	1	0.0713
Boron [mg/L]_Intrawell_APW-10D	1	0.0885
Boron [mg/L]_Intrawell_APW-10D	1	0.0922
Boron [mg/L]_Intrawell_APW-10D	1	0.0923
Boron [mg/L]_Intrawell_APW-10D	1	0.0906
Boron [mg/L]_Intrawell_APW-10D	1	0.118
Boron [mg/L]_Intrawell_APW-10D	1	0.0731
Boron [mg/L]_Intrawell_APW-10D	1	0.0522
Boron [mg/L]_Intrawell_APW-10D	1	0.073
Boron [mg/L]_Intrawell_APW-10D	1	0.0674
Boron [mg/L]_Intrawell_APW-10D	1	0.066
Boron [mg/L]_Intrawell_APW-10D	1	0.0754
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	1	1.1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Cadmium [ug/L]_Intrawell_APW-10D	0	1
Chromium [ug/L]_Intrawell_APW-10D	1	3.6
Chromium [ug/L]_Intrawell_APW-10D	1	7.8
Chromium [ug/L]_Intrawell_APW-10D	1	2.2
Chromium [ug/L]_Intrawell_APW-10D	1	1.1
Chromium [ug/L]_Intrawell_APW-10D	0	1
Chromium [ug/L]_Intrawell_APW-10D	0	1
Chromium [ug/L]_Intrawell_APW-10D	1	4.2
Chromium [ug/L]_Intrawell_APW-10D	0	1
Chromium [ug/L]_Intrawell_APW-10D	0	1.5
Chromium [ug/L]_Intrawell_APW-10D	1	14.8
Chromium [ug/L]_Intrawell_APW-10D	1	2.4
Chromium [ug/L]_Intrawell_APW-10D	0	1.5
Chromium [ug/L]_Intrawell_APW-10D	1	1.5
Chromium [ug/L]_Intrawell_APW-10D	1	4.2
Chromium [ug/L]_Intrawell_APW-10D	1	2.1
Chromium [ug/L]_Intrawell_APW-10D	0	2
Cobalt [ug/L]_Intrawell_APW-10D	1	3.9
Cobalt [ug/L]_Intrawell_APW-10D	1	2.4
Cobalt [ug/L]_Intrawell_APW-10D	1	2.5
Cobalt [ug/L]_Intrawell_APW-10D	1	3.2
Cobalt [ug/L]_Intrawell_APW-10D	1	1.7
Cobalt [ug/L]_Intrawell_APW-10D	1	1.3
Cobalt [ug/L]_Intrawell_APW-10D	1	2.6
Cobalt [ug/L]_Intrawell_APW-10D	1	2.6
Cobalt [ug/L]_Intrawell_APW-10D	1	3.4
Cobalt [ug/L]_Intrawell_APW-10D	1	4.9
Cobalt [ug/L]_Intrawell_APW-10D	1	3
Cobalt [ug/L]_Intrawell_APW-10D	1	3.3
Cobalt [ug/L]_Intrawell_APW-10D	1	7
Cobalt [ug/L]_Intrawell_APW-10D	1	3.1
Cobalt [ug/L]_Intrawell_APW-10D	1	3.9

group	D_report_result_value	report_result_value
Cobalt [ug/L]_Intrawell_APW-10D	1	2.61
Calcium [mg/L]_Intrawell_APW-10D	1	118
Calcium [mg/L]_Intrawell_APW-10D	1	136
Calcium [mg/L]_Intrawell_APW-10D	1	120
Calcium [mg/L]_Intrawell_APW-10D	1	121
Calcium [mg/L]_Intrawell_APW-10D	1	125
Calcium [mg/L]_Intrawell_APW-10D	1	123
Calcium [mg/L]_Intrawell_APW-10D	1	148
Calcium [mg/L]_Intrawell_APW-10D	1	124
Calcium [mg/L]_Intrawell_APW-10D	1	135
Calcium [mg/L]_Intrawell_APW-10D	1	374
Calcium [mg/L]_Intrawell_APW-10D	1	115
Calcium [mg/L]_Intrawell_APW-10D	1	122
Calcium [mg/L]_Intrawell_APW-10D	1	611
Calcium [mg/L]_Intrawell_APW-10D	1	118
Calcium [mg/L]_Intrawell_APW-10D	1	120
Selenium [ug/L]_Intrawell_APW-10D	0	1
Selenium [ug/L]_Intrawell_APW-10D	1	1.1
Selenium [ug/L]_Intrawell_APW-10D	1	1.2
Selenium [ug/L]_Intrawell_APW-10D	1	1.3
Selenium [ug/L]_Intrawell_APW-10D	0	1
Selenium [ug/L]_Intrawell_APW-10D	1	1.4
Selenium [ug/L]_Intrawell_APW-10D	1	1.6
Selenium [ug/L]_Intrawell_APW-10D	1	1.6
Selenium [ug/L]_Intrawell_APW-10D	0	1
Selenium [ug/L]_Intrawell_APW-10D	1	2.1
Selenium [ug/L]_Intrawell_APW-10D	1	1.3
Selenium [ug/L]_Intrawell_APW-10D	1	2.7
Selenium [ug/L]_Intrawell_APW-10D	1	1.6
Selenium [ug/L]_Intrawell_APW-10D	1	1.3
Selenium [ug/L]_Intrawell_APW-10D	1	3.3
Selenium [ug/L]_Intrawell_APW-10D	1	2.69
Molybdenum [ug/L]_Intrawell_APW-10D	1	2.4
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10D	0	5
Nickel [ug/L]_Intrawell_APW-10D	1	9.5
Nickel [ug/L]_Intrawell_APW-10D	1	7.7
Nickel [ug/L]_Intrawell_APW-10D	1	6.5
Nickel [ug/L]_Intrawell_APW-10D	1	5.7
Nickel [ug/L]_Intrawell_APW-10D	1	3.5
Nickel [ug/L]_Intrawell_APW-10D	1	2.5
Nickel [ug/L]_Intrawell_APW-10D	1	7.2
Nickel [ug/L]_Intrawell_APW-10D	1	5.3
Nickel [ug/L]_Intrawell_APW-10D	1	7
Nickel [ug/L]_Intrawell_APW-10D	1	6.3
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2

group	D_report_result_value	report_result_value
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Mercury [ug/L]_Intrawell_APW-10D	0	0.2
Sulfate [mg/L]_Intrawell_APW-10D	1	38
Sulfate [mg/L]_Intrawell_APW-10D	1	44
Sulfate [mg/L]_Intrawell_APW-10D	1	43
Sulfate [mg/L]_Intrawell_APW-10D	1	42
Sulfate [mg/L]_Intrawell_APW-10D	1	42
Sulfate [mg/L]_Intrawell_APW-10D	1	44
Sulfate [mg/L]_Intrawell_APW-10D	1	44
Sulfate [mg/L]_Intrawell_APW-10D	1	44
Sulfate [mg/L]_Intrawell_APW-10D	1	41
Sulfate [mg/L]_Intrawell_APW-10D	1	43
Sulfate [mg/L]_Intrawell_APW-10D	1	42
Sulfate [mg/L]_Intrawell_APW-10D	1	39
Sulfate [mg/L]_Intrawell_APW-10D	1	44
Sulfate [mg/L]_Intrawell_APW-10D	1	31
Sulfate [mg/L]_Intrawell_APW-10D	1	26
Sulfate [mg/L]_Intrawell_APW-10D	1	35.5
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	1.33
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	1.44
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	1.03
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10D	1	1.53
pH, Lab [SU]_Intrawell_APW-10D	1	7.12
pH, Lab [SU]_Intrawell_APW-10D	1	7.11
pH, Lab [SU]_Intrawell_APW-10D	1	7.05
pH, Lab [SU]_Intrawell_APW-10D	1	7.11
pH, Lab [SU]_Intrawell_APW-10D	1	7.12
pH, Lab [SU]_Intrawell_APW-10D	1	7.15
pH, Lab [SU]_Intrawell_APW-10D	1	7.03
pH, Lab [SU]_Intrawell_APW-10D	1	7.03
pH, Lab [SU]_Intrawell_APW-10D	1	7.21
pH, Lab [SU]_Intrawell_APW-10D	1	7.29
pH, Lab [SU]_Intrawell_APW-10D	1	7.04
pH, Lab [SU]_Intrawell_APW-10D	1	7.57
pH, Lab [SU]_Intrawell_APW-10D	1	6.98
pH, Lab [SU]_Intrawell_APW-10D	1	7.22
pH, Lab [SU]_Intrawell_APW-10D	1	7.08
pH, Lab [SU]_Intrawell_APW-10D	1	7.66
Fluoride [ug/L]_Intrawell_APW-10D	1	100
Fluoride [ug/L]_Intrawell_APW-10D	1	120
Fluoride [ug/L]_Intrawell_APW-10D	1	100
Fluoride [ug/L]_Intrawell_APW-10D	0	100
Fluoride [ug/L]_Intrawell_APW-10D	1	110
Fluoride [ug/L]_Intrawell_APW-10D	1	100
Fluoride [ug/L]_Intrawell_APW-10D	1	110
Fluoride [ug/L]_Intrawell_APW-10D	0	100

group	D_report_result_value	report_result_value
Fluoride [ug/L]_Intrawell_APW-10D	1	120
Fluoride [ug/L]_Intrawell_APW-10D	1	100
Fluoride [ug/L]_Intrawell_APW-10D	1	120
Fluoride [ug/L]_Intrawell_APW-10D	1	120
Fluoride [ug/L]_Intrawell_APW-10D	1	110
Fluoride [ug/L]_Intrawell_APW-10D	1	110
Fluoride [ug/L]_Intrawell_APW-10D	1	140
Fluoride [ug/L]_Intrawell_APW-10D	0	150
Chloride [mg/L]_Intrawell_APW-10D	1	24
Chloride [mg/L]_Intrawell_APW-10D	1	17
Chloride [mg/L]_Intrawell_APW-10D	1	17
Chloride [mg/L]_Intrawell_APW-10D	1	15
Chloride [mg/L]_Intrawell_APW-10D	1	17
Chloride [mg/L]_Intrawell_APW-10D	1	16
Chloride [mg/L]_Intrawell_APW-10D	1	14
Chloride [mg/L]_Intrawell_APW-10D	1	16
Chloride [mg/L]_Intrawell_APW-10D	1	16
Chloride [mg/L]_Intrawell_APW-10D	1	18
Chloride [mg/L]_Intrawell_APW-10D	1	14
Chloride [mg/L]_Intrawell_APW-10D	1	13
Chloride [mg/L]_Intrawell_APW-10D	1	14
Chloride [mg/L]_Intrawell_APW-10D	1	10
Chloride [mg/L]_Intrawell_APW-10D	1	10
Chloride [mg/L]_Intrawell_APW-10D	1	15.4
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	708
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	720
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	678
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	708
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	734
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	770
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	762
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	735
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	770
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	750
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	780
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	725
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	775
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	900
Dissolved Solids, Total [mg/L]_Intrawell_APW-10S	1	692
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	1	1
Lead [ug/L]_Intrawell_APW-10S	1	4.3
Lead [ug/L]_Intrawell_APW-10S	1	1.4
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	1	1.6
Lead [ug/L]_Intrawell_APW-10S	1	3.1
Lead [ug/L]_Intrawell_APW-10S	0	1
Lead [ug/L]_Intrawell_APW-10S	0	2
Lithium [ug/L]_Intrawell_APW-10S	1	26.3
Lithium [ug/L]_Intrawell_APW-10S	1	27.8
Lithium [ug/L]_Intrawell_APW-10S	1	27.2
Lithium [ug/L]_Intrawell_APW-10S	1	28.9
Lithium [ug/L]_Intrawell_APW-10S	1	29.3
Lithium [ug/L]_Intrawell_APW-10S	1	30.8
Lithium [ug/L]_Intrawell_APW-10S	1	31.6
Lithium [ug/L]_Intrawell_APW-10S	1	29.7
Lithium [ug/L]_Intrawell_APW-10S	1	35.3
Lithium [ug/L]_Intrawell_APW-10S	1	33

group	D_report_result_value	report_result_value
Lithium [ug/L]_Intrawell_APW-10S	1	30.7
Lithium [ug/L]_Intrawell_APW-10S	1	32.3
Lithium [ug/L]_Intrawell_APW-10S	1	29.1
Lithium [ug/L]_Intrawell_APW-10S	1	30.1
Lithium [ug/L]_Intrawell_APW-10S	1	40.1
Lithium [ug/L]_Intrawell_APW-10S	1	32.8
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	1
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Thallium [ug/L]_Intrawell_APW-10S	0	2
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	1
Antimony [ug/L]_Intrawell_APW-10S	0	4
Arsenic [ug/L]_Intrawell_APW-10S	1	186
Arsenic [ug/L]_Intrawell_APW-10S	1	189
Arsenic [ug/L]_Intrawell_APW-10S	1	180
Arsenic [ug/L]_Intrawell_APW-10S	1	209
Arsenic [ug/L]_Intrawell_APW-10S	1	183
Arsenic [ug/L]_Intrawell_APW-10S	1	193
Arsenic [ug/L]_Intrawell_APW-10S	1	230
Arsenic [ug/L]_Intrawell_APW-10S	1	198
Arsenic [ug/L]_Intrawell_APW-10S	1	185
Arsenic [ug/L]_Intrawell_APW-10S	1	187
Arsenic [ug/L]_Intrawell_APW-10S	1	182
Arsenic [ug/L]_Intrawell_APW-10S	1	191
Arsenic [ug/L]_Intrawell_APW-10S	1	194
Arsenic [ug/L]_Intrawell_APW-10S	1	174
Arsenic [ug/L]_Intrawell_APW-10S	1	276
Arsenic [ug/L]_Intrawell_APW-10S	1	196
Barium [ug/L]_Intrawell_APW-10S	1	613
Barium [ug/L]_Intrawell_APW-10S	1	634
Barium [ug/L]_Intrawell_APW-10S	1	543
Barium [ug/L]_Intrawell_APW-10S	1	668
Barium [ug/L]_Intrawell_APW-10S	1	565
Barium [ug/L]_Intrawell_APW-10S	1	598
Barium [ug/L]_Intrawell_APW-10S	1	703
Barium [ug/L]_Intrawell_APW-10S	1	585
Barium [ug/L]_Intrawell_APW-10S	1	575
Barium [ug/L]_Intrawell_APW-10S	1	612
Barium [ug/L]_Intrawell_APW-10S	1	536

group	D_report_result_value	report_result_value
Barium [ug/L]_Intrawell_APW-10S	1	575
Barium [ug/L]_Intrawell_APW-10S	1	589
Barium [ug/L]_Intrawell_APW-10S	1	591
Barium [ug/L]_Intrawell_APW-10S	1	804
Barium [ug/L]_Intrawell_APW-10S	1	597
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	1
Beryllium [ug/L]_Intrawell_APW-10S	0	2
Boron [mg/L]_Intrawell_APW-10S	1	0.525
Boron [mg/L]_Intrawell_APW-10S	1	0.544
Boron [mg/L]_Intrawell_APW-10S	1	0.536
Boron [mg/L]_Intrawell_APW-10S	1	0.595
Boron [mg/L]_Intrawell_APW-10S	1	0.545
Boron [mg/L]_Intrawell_APW-10S	1	0.573
Boron [mg/L]_Intrawell_APW-10S	1	0.645
Boron [mg/L]_Intrawell_APW-10S	1	0.582
Boron [mg/L]_Intrawell_APW-10S	1	0.683
Boron [mg/L]_Intrawell_APW-10S	1	0.565
Boron [mg/L]_Intrawell_APW-10S	1	0.569
Boron [mg/L]_Intrawell_APW-10S	1	0.592
Boron [mg/L]_Intrawell_APW-10S	1	0.582
Boron [mg/L]_Intrawell_APW-10S	1	0.553
Boron [mg/L]_Intrawell_APW-10S	1	0.555
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Cadmium [ug/L]_Intrawell_APW-10S	0	1
Chromium [ug/L]_Intrawell_APW-10S	1	9.1
Chromium [ug/L]_Intrawell_APW-10S	1	1.9
Chromium [ug/L]_Intrawell_APW-10S	1	1
Chromium [ug/L]_Intrawell_APW-10S	1	1.6
Chromium [ug/L]_Intrawell_APW-10S	0	1
Chromium [ug/L]_Intrawell_APW-10S	1	1.6
Chromium [ug/L]_Intrawell_APW-10S	1	1.9
Chromium [ug/L]_Intrawell_APW-10S	0	1
Chromium [ug/L]_Intrawell_APW-10S	1	1.5
Chromium [ug/L]_Intrawell_APW-10S	1	15
Chromium [ug/L]_Intrawell_APW-10S	1	3.2
Chromium [ug/L]_Intrawell_APW-10S	1	2.3
Chromium [ug/L]_Intrawell_APW-10S	1	2.5

group	D_report_result_value	report_result_value
Chromium [ug/L]_Intrawell_APW-10S	1	8.7
Chromium [ug/L]_Intrawell_APW-10S	1	1.6
Chromium [ug/L]_Intrawell_APW-10S	0	2
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	1	1
Cobalt [ug/L]_Intrawell_APW-10S	1	2.1
Cobalt [ug/L]_Intrawell_APW-10S	1	1.3
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	0	1
Cobalt [ug/L]_Intrawell_APW-10S	1	2.1
Cobalt [ug/L]_Intrawell_APW-10S	1	1.3
Cobalt [ug/L]_Intrawell_APW-10S	0	2
Calcium [mg/L]_Intrawell_APW-10S	1	136
Calcium [mg/L]_Intrawell_APW-10S	1	144
Calcium [mg/L]_Intrawell_APW-10S	1	135
Calcium [mg/L]_Intrawell_APW-10S	1	152
Calcium [mg/L]_Intrawell_APW-10S	1	150
Calcium [mg/L]_Intrawell_APW-10S	1	145
Calcium [mg/L]_Intrawell_APW-10S	1	140
Calcium [mg/L]_Intrawell_APW-10S	1	140
Calcium [mg/L]_Intrawell_APW-10S	1	161
Calcium [mg/L]_Intrawell_APW-10S	1	171
Calcium [mg/L]_Intrawell_APW-10S	1	154
Calcium [mg/L]_Intrawell_APW-10S	1	145
Calcium [mg/L]_Intrawell_APW-10S	1	153
Calcium [mg/L]_Intrawell_APW-10S	1	134
Calcium [mg/L]_Intrawell_APW-10S	1	129
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	1
Selenium [ug/L]_Intrawell_APW-10S	0	2
Molybdenum [ug/L]_Intrawell_APW-10S	1	1.7
Molybdenum [ug/L]_Intrawell_APW-10S	1	1.6
Molybdenum [ug/L]_Intrawell_APW-10S	0	1
Molybdenum [ug/L]_Intrawell_APW-10S	0	1
Molybdenum [ug/L]_Intrawell_APW-10S	0	1
Molybdenum [ug/L]_Intrawell_APW-10S	0	1
Molybdenum [ug/L]_Intrawell_APW-10S	0	1
Molybdenum [ug/L]_Intrawell_APW-10S	0	1
Molybdenum [ug/L]_Intrawell_APW-10S	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10S	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10S	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10S	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10S	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10S	0	1.5
Molybdenum [ug/L]_Intrawell_APW-10S	1	2.1

group	D_report_result_value	report_result_value
Molybdenum [ug/L]_Intrawell_APW-10S	0	5
Nickel [ug/L]_Intrawell_APW-10S	1	5.1
Nickel [ug/L]_Intrawell_APW-10S	1	1.2
Nickel [ug/L]_Intrawell_APW-10S	0	1
Nickel [ug/L]_Intrawell_APW-10S	1	1.5
Nickel [ug/L]_Intrawell_APW-10S	0	1
Nickel [ug/L]_Intrawell_APW-10S	0	1
Nickel [ug/L]_Intrawell_APW-10S	1	1.4
Nickel [ug/L]_Intrawell_APW-10S	0	1
Nickel [ug/L]_Intrawell_APW-10S	1	1.4
Nickel [ug/L]_Intrawell_APW-10S	1	3.1
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Mercury [ug/L]_Intrawell_APW-10S	0	0.2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	1.63
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	3
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	1.25
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2.82
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	1.24
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	4.83
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-10S	1	2.42
Sulfate [mg/L]_Intrawell_APW-10S	1	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	1	21
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	10
Sulfate [mg/L]_Intrawell_APW-10S	0	5
pH, Lab [SU]_Intrawell_APW-10S	1	6.99
pH, Lab [SU]_Intrawell_APW-10S	1	6.96
pH, Lab [SU]_Intrawell_APW-10S	1	6.95
pH, Lab [SU]_Intrawell_APW-10S	1	6.98
pH, Lab [SU]_Intrawell_APW-10S	1	6.97
pH, Lab [SU]_Intrawell_APW-10S	1	6.98

group	D_report_result_value	report_result_value
pH, Lab [SU]_Intrawell_APW-10S	1	7.06
pH, Lab [SU]_Intrawell_APW-10S	1	6.91
pH, Lab [SU]_Intrawell_APW-10S	1	7.09
pH, Lab [SU]_Intrawell_APW-10S	1	7.2
pH, Lab [SU]_Intrawell_APW-10S	1	6.95
pH, Lab [SU]_Intrawell_APW-10S	1	7.2
pH, Lab [SU]_Intrawell_APW-10S	1	7.01
pH, Lab [SU]_Intrawell_APW-10S	1	7.17
pH, Lab [SU]_Intrawell_APW-10S	1	7.01
pH, Lab [SU]_Intrawell_APW-10S	1	7.58
Fluoride [ug/L]_Intrawell_APW-10S	1	190
Fluoride [ug/L]_Intrawell_APW-10S	1	210
Fluoride [ug/L]_Intrawell_APW-10S	1	160
Fluoride [ug/L]_Intrawell_APW-10S	1	160
Fluoride [ug/L]_Intrawell_APW-10S	1	160
Fluoride [ug/L]_Intrawell_APW-10S	1	170
Fluoride [ug/L]_Intrawell_APW-10S	1	170
Fluoride [ug/L]_Intrawell_APW-10S	1	160
Fluoride [ug/L]_Intrawell_APW-10S	1	170
Fluoride [ug/L]_Intrawell_APW-10S	1	150
Fluoride [ug/L]_Intrawell_APW-10S	1	170
Fluoride [ug/L]_Intrawell_APW-10S	1	150
Fluoride [ug/L]_Intrawell_APW-10S	1	150
Fluoride [ug/L]_Intrawell_APW-10S	1	160
Fluoride [ug/L]_Intrawell_APW-10S	1	180
Fluoride [ug/L]_Intrawell_APW-10S	0	150
Chloride [mg/L]_Intrawell_APW-10S	1	10
Chloride [mg/L]_Intrawell_APW-10S	1	7
Chloride [mg/L]_Intrawell_APW-10S	1	6
Chloride [mg/L]_Intrawell_APW-10S	1	6
Chloride [mg/L]_Intrawell_APW-10S	1	6
Chloride [mg/L]_Intrawell_APW-10S	1	6
Chloride [mg/L]_Intrawell_APW-10S	1	6
Chloride [mg/L]_Intrawell_APW-10S	1	6
Chloride [mg/L]_Intrawell_APW-10S	1	12
Chloride [mg/L]_Intrawell_APW-10S	1	15
Chloride [mg/L]_Intrawell_APW-10S	1	18
Chloride [mg/L]_Intrawell_APW-10S	1	21
Chloride [mg/L]_Intrawell_APW-10S	1	14
Chloride [mg/L]_Intrawell_APW-10S	1	15
Chloride [mg/L]_Intrawell_APW-10S	1	20
Chloride [mg/L]_Intrawell_APW-10S	1	17.2
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	438
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	458
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	436
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	446
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	466
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	410
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	398
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	442
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	382
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	372
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	370
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	378
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	420
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	440
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	395
Dissolved Solids, Total [mg/L]_Intrawell_APW-08	1	370
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	0	1

group	D_report_result_value	report_result_value
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	1	2.4
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	1	1.2
Lead [ug/L]_Intrawell_APW-08	0	1
Lead [ug/L]_Intrawell_APW-08	1	2.8
Lead [ug/L]_Intrawell_APW-08	1	1.5
Lead [ug/L]_Intrawell_APW-08	1	1.8
Lead [ug/L]_Intrawell_APW-08	0	2
Lithium [ug/L]_Intrawell_APW-08	1	19.6
Lithium [ug/L]_Intrawell_APW-08	1	20.6
Lithium [ug/L]_Intrawell_APW-08	1	20.7
Lithium [ug/L]_Intrawell_APW-08	1	21.6
Lithium [ug/L]_Intrawell_APW-08	1	22.3
Lithium [ug/L]_Intrawell_APW-08	1	21.6
Lithium [ug/L]_Intrawell_APW-08	1	19.2
Lithium [ug/L]_Intrawell_APW-08	1	19.6
Lithium [ug/L]_Intrawell_APW-08	1	16
Lithium [ug/L]_Intrawell_APW-08	1	16
Lithium [ug/L]_Intrawell_APW-08	1	14.7
Lithium [ug/L]_Intrawell_APW-08	1	15.5
Lithium [ug/L]_Intrawell_APW-08	1	15.7
Lithium [ug/L]_Intrawell_APW-08	1	17.7
Lithium [ug/L]_Intrawell_APW-08	1	21.1
Lithium [ug/L]_Intrawell_APW-08	1	14.2
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	1
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Thallium [ug/L]_Intrawell_APW-08	0	2
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	1
Antimony [ug/L]_Intrawell_APW-08	0	4
Arsenic [ug/L]_Intrawell_APW-08	0	1
Arsenic [ug/L]_Intrawell_APW-08	1	1.1
Arsenic [ug/L]_Intrawell_APW-08	0	1
Arsenic [ug/L]_Intrawell_APW-08	0	1
Arsenic [ug/L]_Intrawell_APW-08	0	1
Arsenic [ug/L]_Intrawell_APW-08	1	1
Arsenic [ug/L]_Intrawell_APW-08	0	1
Arsenic [ug/L]_Intrawell_APW-08	0	1

group	D_report_result_value	report_result_value
Arsenic [ug/L]_Intrawell_APW-08	1	2.2
Arsenic [ug/L]_Intrawell_APW-08	1	1.5
Arsenic [ug/L]_Intrawell_APW-08	1	1.7
Arsenic [ug/L]_Intrawell_APW-08	1	1.6
Arsenic [ug/L]_Intrawell_APW-08	1	2
Arsenic [ug/L]_Intrawell_APW-08	1	1.8
Arsenic [ug/L]_Intrawell_APW-08	1	2.5
Arsenic [ug/L]_Intrawell_APW-08	0	2
Barium [ug/L]_Intrawell_APW-08	1	207
Barium [ug/L]_Intrawell_APW-08	1	256
Barium [ug/L]_Intrawell_APW-08	1	219
Barium [ug/L]_Intrawell_APW-08	1	240
Barium [ug/L]_Intrawell_APW-08	1	217
Barium [ug/L]_Intrawell_APW-08	1	223
Barium [ug/L]_Intrawell_APW-08	1	226
Barium [ug/L]_Intrawell_APW-08	1	215
Barium [ug/L]_Intrawell_APW-08	1	235
Barium [ug/L]_Intrawell_APW-08	1	190
Barium [ug/L]_Intrawell_APW-08	1	179
Barium [ug/L]_Intrawell_APW-08	1	167
Barium [ug/L]_Intrawell_APW-08	1	225
Barium [ug/L]_Intrawell_APW-08	1	199
Barium [ug/L]_Intrawell_APW-08	1	261
Barium [ug/L]_Intrawell_APW-08	1	170
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	1
Beryllium [ug/L]_Intrawell_APW-08	0	2
Boron [mg/L]_Intrawell_APW-08	1	0.132
Boron [mg/L]_Intrawell_APW-08	1	0.154
Boron [mg/L]_Intrawell_APW-08	1	0.135
Boron [mg/L]_Intrawell_APW-08	1	0.138
Boron [mg/L]_Intrawell_APW-08	1	0.141
Boron [mg/L]_Intrawell_APW-08	1	0.145
Boron [mg/L]_Intrawell_APW-08	1	0.151
Boron [mg/L]_Intrawell_APW-08	1	0.132
Boron [mg/L]_Intrawell_APW-08	1	0.115
Boron [mg/L]_Intrawell_APW-08	1	0.11
Boron [mg/L]_Intrawell_APW-08	1	0.103
Boron [mg/L]_Intrawell_APW-08	1	0.095
Boron [mg/L]_Intrawell_APW-08	1	0.103
Boron [mg/L]_Intrawell_APW-08	1	0.116
Boron [mg/L]_Intrawell_APW-08	1	0.155
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	1	1
Cadmium [ug/L]_Intrawell_APW-08	0	1

group	D_report_result_value	report_result_value
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Cadmium [ug/L]_Intrawell_APW-08	0	1
Chromium [ug/L]_Intrawell_APW-08	1	1.8
Chromium [ug/L]_Intrawell_APW-08	1	2.3
Chromium [ug/L]_Intrawell_APW-08	0	1
Chromium [ug/L]_Intrawell_APW-08	1	5.9
Chromium [ug/L]_Intrawell_APW-08	0	1
Chromium [ug/L]_Intrawell_APW-08	1	2.1
Chromium [ug/L]_Intrawell_APW-08	0	1
Chromium [ug/L]_Intrawell_APW-08	0	1
Chromium [ug/L]_Intrawell_APW-08	1	5.4
Chromium [ug/L]_Intrawell_APW-08	1	1.6
Chromium [ug/L]_Intrawell_APW-08	1	3.6
Chromium [ug/L]_Intrawell_APW-08	1	2.7
Chromium [ug/L]_Intrawell_APW-08	1	8.2
Chromium [ug/L]_Intrawell_APW-08	1	3.1
Chromium [ug/L]_Intrawell_APW-08	1	4.9
Chromium [ug/L]_Intrawell_APW-08	0	2
Cobalt [ug/L]_Intrawell_APW-08	1	1.7
Cobalt [ug/L]_Intrawell_APW-08	1	1.3
Cobalt [ug/L]_Intrawell_APW-08	1	1
Cobalt [ug/L]_Intrawell_APW-08	1	1.2
Cobalt [ug/L]_Intrawell_APW-08	0	1
Cobalt [ug/L]_Intrawell_APW-08	0	1
Cobalt [ug/L]_Intrawell_APW-08	0	1
Cobalt [ug/L]_Intrawell_APW-08	0	1
Cobalt [ug/L]_Intrawell_APW-08	1	2
Cobalt [ug/L]_Intrawell_APW-08	1	1.3
Cobalt [ug/L]_Intrawell_APW-08	1	1.6
Cobalt [ug/L]_Intrawell_APW-08	1	1.2
Cobalt [ug/L]_Intrawell_APW-08	1	1.9
Cobalt [ug/L]_Intrawell_APW-08	1	1.4
Cobalt [ug/L]_Intrawell_APW-08	1	2.1
Cobalt [ug/L]_Intrawell_APW-08	0	2
Calcium [mg/L]_Intrawell_APW-08	1	97.4
Calcium [mg/L]_Intrawell_APW-08	1	105
Calcium [mg/L]_Intrawell_APW-08	1	92.6
Calcium [mg/L]_Intrawell_APW-08	1	101
Calcium [mg/L]_Intrawell_APW-08	1	102
Calcium [mg/L]_Intrawell_APW-08	1	98.6
Calcium [mg/L]_Intrawell_APW-08	1	95
Calcium [mg/L]_Intrawell_APW-08	1	97.8
Calcium [mg/L]_Intrawell_APW-08	1	93.3
Calcium [mg/L]_Intrawell_APW-08	1	85.1
Calcium [mg/L]_Intrawell_APW-08	1	82.8
Calcium [mg/L]_Intrawell_APW-08	1	79.4
Calcium [mg/L]_Intrawell_APW-08	1	99.4
Calcium [mg/L]_Intrawell_APW-08	1	86.4
Calcium [mg/L]_Intrawell_APW-08	1	81.2
Selenium [ug/L]_Intrawell_APW-08	1	8
Selenium [ug/L]_Intrawell_APW-08	1	14.1
Selenium [ug/L]_Intrawell_APW-08	1	13.2
Selenium [ug/L]_Intrawell_APW-08	1	14.9
Selenium [ug/L]_Intrawell_APW-08	1	13.5
Selenium [ug/L]_Intrawell_APW-08	1	14.1
Selenium [ug/L]_Intrawell_APW-08	1	14.9
Selenium [ug/L]_Intrawell_APW-08	1	13
Selenium [ug/L]_Intrawell_APW-08	1	3.6
Selenium [ug/L]_Intrawell_APW-08	1	7.7
Selenium [ug/L]_Intrawell_APW-08	1	11
Selenium [ug/L]_Intrawell_APW-08	1	14.8

group	D_report_result_value	report_result_value
Selenium [ug/L]_Intrawell_APW-08	1	12.9
Selenium [ug/L]_Intrawell_APW-08	1	12.2
Selenium [ug/L]_Intrawell_APW-08	1	22.1
Selenium [ug/L]_Intrawell_APW-08	1	16.9
Molybdenum [ug/L]_Intrawell_APW-08	1	1.1
Molybdenum [ug/L]_Intrawell_APW-08	0	1
Molybdenum [ug/L]_Intrawell_APW-08	0	1
Molybdenum [ug/L]_Intrawell_APW-08	1	1.1
Molybdenum [ug/L]_Intrawell_APW-08	0	1
Molybdenum [ug/L]_Intrawell_APW-08	0	1
Molybdenum [ug/L]_Intrawell_APW-08	0	1
Molybdenum [ug/L]_Intrawell_APW-08	0	1
Molybdenum [ug/L]_Intrawell_APW-08	1	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	1.5
Molybdenum [ug/L]_Intrawell_APW-08	0	5
Nickel [ug/L]_Intrawell_APW-08	1	3.9
Nickel [ug/L]_Intrawell_APW-08	1	4.3
Nickel [ug/L]_Intrawell_APW-08	1	2.9
Nickel [ug/L]_Intrawell_APW-08	1	6.2
Nickel [ug/L]_Intrawell_APW-08	1	2.6
Nickel [ug/L]_Intrawell_APW-08	1	2.7
Nickel [ug/L]_Intrawell_APW-08	1	2.6
Nickel [ug/L]_Intrawell_APW-08	1	2.6
Nickel [ug/L]_Intrawell_APW-08	1	5.4
Nickel [ug/L]_Intrawell_APW-08	1	7.7
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Mercury [ug/L]_Intrawell_APW-08	0	0.2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	1.61
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	0.735
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2.08
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	0.611
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-08	1	2.39
Sulfate [mg/L]_Intrawell_APW-08	1	43
Sulfate [mg/L]_Intrawell_APW-08	1	40
Sulfate [mg/L]_Intrawell_APW-08	1	38

group	D_report_result_value	report_result_value
Sulfate [mg/L]_Intrawell_APW-08	1	40
Sulfate [mg/L]_Intrawell_APW-08	1	39
Sulfate [mg/L]_Intrawell_APW-08	1	38
Sulfate [mg/L]_Intrawell_APW-08	1	39
Sulfate [mg/L]_Intrawell_APW-08	1	37
Sulfate [mg/L]_Intrawell_APW-08	1	39
Sulfate [mg/L]_Intrawell_APW-08	1	39
Sulfate [mg/L]_Intrawell_APW-08	1	34
Sulfate [mg/L]_Intrawell_APW-08	1	29
Sulfate [mg/L]_Intrawell_APW-08	1	31
Sulfate [mg/L]_Intrawell_APW-08	1	23
Sulfate [mg/L]_Intrawell_APW-08	1	24
Sulfate [mg/L]_Intrawell_APW-08	1	24.7
pH, Lab [SU]_Intrawell_APW-08	1	7.04
pH, Lab [SU]_Intrawell_APW-08	1	7.07
pH, Lab [SU]_Intrawell_APW-08	1	7
pH, Lab [SU]_Intrawell_APW-08	1	7.12
pH, Lab [SU]_Intrawell_APW-08	1	7.25
pH, Lab [SU]_Intrawell_APW-08	1	7.11
pH, Lab [SU]_Intrawell_APW-08	1	7.04
pH, Lab [SU]_Intrawell_APW-08	1	7.04
pH, Lab [SU]_Intrawell_APW-08	1	7.34
pH, Lab [SU]_Intrawell_APW-08	1	7.47
pH, Lab [SU]_Intrawell_APW-08	1	7.25
pH, Lab [SU]_Intrawell_APW-08	1	7.31
pH, Lab [SU]_Intrawell_APW-08	1	7.18
pH, Lab [SU]_Intrawell_APW-08	1	7.16
pH, Lab [SU]_Intrawell_APW-08	1	7.27
pH, Lab [SU]_Intrawell_APW-08	1	7.68
Fluoride [ug/L]_Intrawell_APW-08	1	300
Fluoride [ug/L]_Intrawell_APW-08	1	300
Fluoride [ug/L]_Intrawell_APW-08	1	290
Fluoride [ug/L]_Intrawell_APW-08	1	290
Fluoride [ug/L]_Intrawell_APW-08	1	280
Fluoride [ug/L]_Intrawell_APW-08	1	280
Fluoride [ug/L]_Intrawell_APW-08	1	300
Fluoride [ug/L]_Intrawell_APW-08	1	280
Fluoride [ug/L]_Intrawell_APW-08	1	290
Fluoride [ug/L]_Intrawell_APW-08	1	260
Fluoride [ug/L]_Intrawell_APW-08	1	280
Fluoride [ug/L]_Intrawell_APW-08	1	260
Fluoride [ug/L]_Intrawell_APW-08	1	260
Fluoride [ug/L]_Intrawell_APW-08	1	260
Fluoride [ug/L]_Intrawell_APW-08	1	290
Fluoride [ug/L]_Intrawell_APW-08	1	232
Chloride [mg/L]_Intrawell_APW-08	1	9
Chloride [mg/L]_Intrawell_APW-08	1	10
Chloride [mg/L]_Intrawell_APW-08	1	10
Chloride [mg/L]_Intrawell_APW-08	1	10
Chloride [mg/L]_Intrawell_APW-08	1	10
Chloride [mg/L]_Intrawell_APW-08	1	11
Chloride [mg/L]_Intrawell_APW-08	1	12
Chloride [mg/L]_Intrawell_APW-08	1	11
Chloride [mg/L]_Intrawell_APW-08	1	9
Chloride [mg/L]_Intrawell_APW-08	1	11
Chloride [mg/L]_Intrawell_APW-08	1	12
Chloride [mg/L]_Intrawell_APW-08	1	13
Chloride [mg/L]_Intrawell_APW-08	1	10
Chloride [mg/L]_Intrawell_APW-08	1	10
Chloride [mg/L]_Intrawell_APW-08	1	11
Chloride [mg/L]_Intrawell_APW-08	1	10.6
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	1.29
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2

group	D_report_result_value	report_result_value
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	1.1
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2.1
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2
Radium-226/228 [pCi/L]_Intrawell_APW-07	1	2.7
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	762
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	786
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	624
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	730
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	742
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	736
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	720
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	740
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	780
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	815
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	800
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	824
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	665
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	740
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	790
Dissolved Solids, Total [mg/L]_Intrawell_APW-07	1	734
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	1	7.4
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	1
Lead [ug/L]_Intrawell_APW-07	0	2
Lithium [ug/L]_Intrawell_APW-07	1	14.7
Lithium [ug/L]_Intrawell_APW-07	1	18.1
Lithium [ug/L]_Intrawell_APW-07	1	17.2
Lithium [ug/L]_Intrawell_APW-07	1	17.6
Lithium [ug/L]_Intrawell_APW-07	1	18.5
Lithium [ug/L]_Intrawell_APW-07	1	19.1
Lithium [ug/L]_Intrawell_APW-07	1	18.1
Lithium [ug/L]_Intrawell_APW-07	1	17.8
Lithium [ug/L]_Intrawell_APW-07	1	14.3
Lithium [ug/L]_Intrawell_APW-07	1	16.1
Lithium [ug/L]_Intrawell_APW-07	1	16.6
Lithium [ug/L]_Intrawell_APW-07	1	18.1
Lithium [ug/L]_Intrawell_APW-07	1	15.3
Lithium [ug/L]_Intrawell_APW-07	1	14.1
Lithium [ug/L]_Intrawell_APW-07	1	23.1
Lithium [ug/L]_Intrawell_APW-07	1	19
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	1

group	D_report_result_value	report_result_value
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	1
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Thallium [ug/L]_Intrawell_APW-07	0	2
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	1
Antimony [ug/L]_Intrawell_APW-07	0	4
Arsenic [ug/L]_Intrawell_APW-07	1	1.4
Arsenic [ug/L]_Intrawell_APW-07	1	1.2
Arsenic [ug/L]_Intrawell_APW-07	0	1
Arsenic [ug/L]_Intrawell_APW-07	0	1
Arsenic [ug/L]_Intrawell_APW-07	0	1
Arsenic [ug/L]_Intrawell_APW-07	0	1
Arsenic [ug/L]_Intrawell_APW-07	0	1
Arsenic [ug/L]_Intrawell_APW-07	0	1
Arsenic [ug/L]_Intrawell_APW-07	1	2.3
Arsenic [ug/L]_Intrawell_APW-07	1	1.6
Arsenic [ug/L]_Intrawell_APW-07	1	1.1
Arsenic [ug/L]_Intrawell_APW-07	1	1.4
Arsenic [ug/L]_Intrawell_APW-07	1	1.4
Arsenic [ug/L]_Intrawell_APW-07	1	1.8
Arsenic [ug/L]_Intrawell_APW-07	1	2.2
Arsenic [ug/L]_Intrawell_APW-07	0	2
Barium [ug/L]_Intrawell_APW-07	1	465
Barium [ug/L]_Intrawell_APW-07	1	448
Barium [ug/L]_Intrawell_APW-07	1	394
Barium [ug/L]_Intrawell_APW-07	1	401
Barium [ug/L]_Intrawell_APW-07	1	370
Barium [ug/L]_Intrawell_APW-07	1	374
Barium [ug/L]_Intrawell_APW-07	1	380
Barium [ug/L]_Intrawell_APW-07	1	359
Barium [ug/L]_Intrawell_APW-07	1	374
Barium [ug/L]_Intrawell_APW-07	1	382
Barium [ug/L]_Intrawell_APW-07	1	381
Barium [ug/L]_Intrawell_APW-07	1	371
Barium [ug/L]_Intrawell_APW-07	1	312
Barium [ug/L]_Intrawell_APW-07	1	303
Barium [ug/L]_Intrawell_APW-07	1	522
Barium [ug/L]_Intrawell_APW-07	1	360
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1

group	D_report_result_value	report_result_value
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	1
Beryllium [ug/L]_Intrawell_APW-07	0	2
Boron [mg/L]_Intrawell_APW-07	1	0.235
Boron [mg/L]_Intrawell_APW-07	1	0.308
Boron [mg/L]_Intrawell_APW-07	1	0.302
Boron [mg/L]_Intrawell_APW-07	1	0.3
Boron [mg/L]_Intrawell_APW-07	1	0.278
Boron [mg/L]_Intrawell_APW-07	1	0.342
Boron [mg/L]_Intrawell_APW-07	1	0.298
Boron [mg/L]_Intrawell_APW-07	1	0.318
Boron [mg/L]_Intrawell_APW-07	1	0.168
Boron [mg/L]_Intrawell_APW-07	1	0.208
Boron [mg/L]_Intrawell_APW-07	1	0.217
Boron [mg/L]_Intrawell_APW-07	1	0.246
Boron [mg/L]_Intrawell_APW-07	1	0.237
Boron [mg/L]_Intrawell_APW-07	1	0.181
Boron [mg/L]_Intrawell_APW-07	1	0.274
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Cadmium [ug/L]_Intrawell_APW-07	0	1
Chromium [ug/L]_Intrawell_APW-07	1	1.7
Chromium [ug/L]_Intrawell_APW-07	1	6.3
Chromium [ug/L]_Intrawell_APW-07	1	2.6
Chromium [ug/L]_Intrawell_APW-07	0	1
Chromium [ug/L]_Intrawell_APW-07	0	1
Chromium [ug/L]_Intrawell_APW-07	1	32.9
Chromium [ug/L]_Intrawell_APW-07	0	1
Chromium [ug/L]_Intrawell_APW-07	0	1
Chromium [ug/L]_Intrawell_APW-07	1	4.1
Chromium [ug/L]_Intrawell_APW-07	1	2.1
Chromium [ug/L]_Intrawell_APW-07	0	1.5
Chromium [ug/L]_Intrawell_APW-07	1	3.4
Chromium [ug/L]_Intrawell_APW-07	0	1.5
Chromium [ug/L]_Intrawell_APW-07	1	5.7
Chromium [ug/L]_Intrawell_APW-07	1	2.4
Chromium [ug/L]_Intrawell_APW-07	0	2
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1

group	D_report_result_value	report_result_value
Cobalt [ug/L]_Intrawell_APW-07	1	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	0	1
Cobalt [ug/L]_Intrawell_APW-07	1	1.3
Cobalt [ug/L]_Intrawell_APW-07	0	2
Calcium [mg/L]_Intrawell_APW-07	1	192
Calcium [mg/L]_Intrawell_APW-07	1	204
Calcium [mg/L]_Intrawell_APW-07	1	171
Calcium [mg/L]_Intrawell_APW-07	1	187
Calcium [mg/L]_Intrawell_APW-07	1	196
Calcium [mg/L]_Intrawell_APW-07	1	193
Calcium [mg/L]_Intrawell_APW-07	1	191
Calcium [mg/L]_Intrawell_APW-07	1	185
Calcium [mg/L]_Intrawell_APW-07	1	238
Calcium [mg/L]_Intrawell_APW-07	1	210
Calcium [mg/L]_Intrawell_APW-07	1	209
Calcium [mg/L]_Intrawell_APW-07	1	200
Calcium [mg/L]_Intrawell_APW-07	1	183
Calcium [mg/L]_Intrawell_APW-07	1	161
Calcium [mg/L]_Intrawell_APW-07	1	177
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	1
Selenium [ug/L]_Intrawell_APW-07	0	2
Molybdenum [ug/L]_Intrawell_APW-07	1	4.6
Molybdenum [ug/L]_Intrawell_APW-07	1	3.6
Molybdenum [ug/L]_Intrawell_APW-07	1	3.3
Molybdenum [ug/L]_Intrawell_APW-07	1	2.3
Molybdenum [ug/L]_Intrawell_APW-07	1	3
Molybdenum [ug/L]_Intrawell_APW-07	1	4.4
Molybdenum [ug/L]_Intrawell_APW-07	1	3.7
Molybdenum [ug/L]_Intrawell_APW-07	1	3.6
Molybdenum [ug/L]_Intrawell_APW-07	1	3.5
Molybdenum [ug/L]_Intrawell_APW-07	1	3
Molybdenum [ug/L]_Intrawell_APW-07	1	2.9
Molybdenum [ug/L]_Intrawell_APW-07	1	3.1
Molybdenum [ug/L]_Intrawell_APW-07	1	2.8
Molybdenum [ug/L]_Intrawell_APW-07	1	2.9
Molybdenum [ug/L]_Intrawell_APW-07	1	4.2
Molybdenum [ug/L]_Intrawell_APW-07	0	5
Nickel [ug/L]_Intrawell_APW-07	1	1.4
Nickel [ug/L]_Intrawell_APW-07	1	3.3
Nickel [ug/L]_Intrawell_APW-07	1	1.3
Nickel [ug/L]_Intrawell_APW-07	0	1
Nickel [ug/L]_Intrawell_APW-07	0	1
Nickel [ug/L]_Intrawell_APW-07	1	15
Nickel [ug/L]_Intrawell_APW-07	0	1
Nickel [ug/L]_Intrawell_APW-07	0	1
Nickel [ug/L]_Intrawell_APW-07	1	4.2
Nickel [ug/L]_Intrawell_APW-07	0	1

group	D_report_result_value	report_result_value
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Mercury [ug/L]_Intrawell_APW-07	0	0.2
Sulfate [mg/L]_Intrawell_APW-07	1	66
Sulfate [mg/L]_Intrawell_APW-07	1	59
Sulfate [mg/L]_Intrawell_APW-07	1	52
Sulfate [mg/L]_Intrawell_APW-07	1	50
Sulfate [mg/L]_Intrawell_APW-07	1	61
Sulfate [mg/L]_Intrawell_APW-07	1	63
Sulfate [mg/L]_Intrawell_APW-07	1	67
Sulfate [mg/L]_Intrawell_APW-07	1	64
Sulfate [mg/L]_Intrawell_APW-07	1	72
Sulfate [mg/L]_Intrawell_APW-07	1	78
Sulfate [mg/L]_Intrawell_APW-07	1	48
Sulfate [mg/L]_Intrawell_APW-07	1	48
Sulfate [mg/L]_Intrawell_APW-07	1	54
Sulfate [mg/L]_Intrawell_APW-07	1	44
Sulfate [mg/L]_Intrawell_APW-07	1	40
Sulfate [mg/L]_Intrawell_APW-07	1	68.8
pH, Lab [SU]_Intrawell_APW-07	1	6.84
pH, Lab [SU]_Intrawell_APW-07	1	6.84
pH, Lab [SU]_Intrawell_APW-07	1	6.86
pH, Lab [SU]_Intrawell_APW-07	1	6.87
pH, Lab [SU]_Intrawell_APW-07	1	6.83
pH, Lab [SU]_Intrawell_APW-07	1	6.96
pH, Lab [SU]_Intrawell_APW-07	1	6.97
pH, Lab [SU]_Intrawell_APW-07	1	6.88
pH, Lab [SU]_Intrawell_APW-07	1	6.88
pH, Lab [SU]_Intrawell_APW-07	1	7.02
pH, Lab [SU]_Intrawell_APW-07	1	6.78
pH, Lab [SU]_Intrawell_APW-07	1	7.23
pH, Lab [SU]_Intrawell_APW-07	1	6.79
pH, Lab [SU]_Intrawell_APW-07	1	6.94
pH, Lab [SU]_Intrawell_APW-07	1	6.86
pH, Lab [SU]_Intrawell_APW-07	1	7.31
Fluoride [ug/L]_Intrawell_APW-07	1	350
Fluoride [ug/L]_Intrawell_APW-07	1	210
Fluoride [ug/L]_Intrawell_APW-07	1	190
Fluoride [ug/L]_Intrawell_APW-07	1	200
Fluoride [ug/L]_Intrawell_APW-07	1	200
Fluoride [ug/L]_Intrawell_APW-07	1	190
Fluoride [ug/L]_Intrawell_APW-07	1	200
Fluoride [ug/L]_Intrawell_APW-07	1	180
Fluoride [ug/L]_Intrawell_APW-07	1	180
Fluoride [ug/L]_Intrawell_APW-07	1	170
Fluoride [ug/L]_Intrawell_APW-07	1	180
Fluoride [ug/L]_Intrawell_APW-07	1	190
Fluoride [ug/L]_Intrawell_APW-07	1	170
Fluoride [ug/L]_Intrawell_APW-07	1	180
Fluoride [ug/L]_Intrawell_APW-07	1	200
Fluoride [ug/L]_Intrawell_APW-07	1	172
Chloride [mg/L]_Intrawell_APW-07	1	15

group	D_report_result_value	report_result_value
Chloride [mg/L]_Intrawell_APW-07	1	15
Chloride [mg/L]_Intrawell_APW-07	1	14
Chloride [mg/L]_Intrawell_APW-07	1	15
Chloride [mg/L]_Intrawell_APW-07	1	16
Chloride [mg/L]_Intrawell_APW-07	1	15
Chloride [mg/L]_Intrawell_APW-07	1	15
Chloride [mg/L]_Intrawell_APW-07	1	15
Chloride [mg/L]_Intrawell_APW-07	1	11
Chloride [mg/L]_Intrawell_APW-07	1	12
Chloride [mg/L]_Intrawell_APW-07	1	12
Chloride [mg/L]_Intrawell_APW-07	1	14
Chloride [mg/L]_Intrawell_APW-07	1	10
Chloride [mg/L]_Intrawell_APW-07	1	9
Chloride [mg/L]_Intrawell_APW-07	1	11
Chloride [mg/L]_Intrawell_APW-07	1	11.5
Iron [mg/L]_Intrawell_APW-10S	1	19.6
Iron [mg/L]_Intrawell_APW-10S	1	17.2
Manganese [mg/L]_Intrawell_APW-10S	1	0.243
Manganese [mg/L]_Intrawell_APW-10S	1	0.174
Turbidity, Field [NTU]_Intrawell_APW-10S	1	61.5
Turbidity, Field [NTU]_Intrawell_APW-10S	1	34.3
Turbidity, Field [NTU]_Intrawell_APW-10S	1	52.6
Turbidity, Field [NTU]_Intrawell_APW-10S	1	37.3
Turbidity, Field [NTU]_Intrawell_APW-10S	1	57.2
Turbidity, Field [NTU]_Intrawell_APW-10S	1	63.6
Turbidity, Field [NTU]_Intrawell_APW-10S	1	13.1
Turbidity, Field [NTU]_Intrawell_APW-10S	1	3.78
Iron [mg/L]_Intrawell_APW-10D	1	0.758
Iron [mg/L]_Intrawell_APW-10D	1	0.175
Manganese [mg/L]_Intrawell_APW-10D	1	1.16
Manganese [mg/L]_Intrawell_APW-10D	1	0.88
Turbidity, Field [NTU]_Intrawell_APW-10D	1	46.9
Turbidity, Field [NTU]_Intrawell_APW-10D	1	21.9
Turbidity, Field [NTU]_Intrawell_APW-10D	1	36.4
Turbidity, Field [NTU]_Intrawell_APW-10D	1	45.3
Turbidity, Field [NTU]_Intrawell_APW-10D	1	176
Turbidity, Field [NTU]_Intrawell_APW-10D	1	169
Turbidity, Field [NTU]_Intrawell_APW-10D	1	196
Turbidity, Field [NTU]_Intrawell_APW-10D	1	4.76
Iron [mg/L]_Intrawell_APW-08	1	3.14
Iron [mg/L]_Intrawell_APW-08	1	0.44
Manganese [mg/L]_Intrawell_APW-08	1	0.202
Manganese [mg/L]_Intrawell_APW-08	1	0.0435
Turbidity, Field [NTU]_Intrawell_APW-08	1	119
Turbidity, Field [NTU]_Intrawell_APW-08	1	139
Turbidity, Field [NTU]_Intrawell_APW-08	1	305
Turbidity, Field [NTU]_Intrawell_APW-08	1	26.9
Turbidity, Field [NTU]_Intrawell_APW-08	1	152
Turbidity, Field [NTU]_Intrawell_APW-08	1	141
Turbidity, Field [NTU]_Intrawell_APW-08	1	169
Turbidity, Field [NTU]_Intrawell_APW-08	1	23.1
Iron [mg/L]_Intrawell_APW-03	1	1.66
Iron [mg/L]_Intrawell_APW-03	1	0.367
Manganese [mg/L]_Intrawell_APW-03	1	0.321
Manganese [mg/L]_Intrawell_APW-03	1	0.435
Turbidity, Field [NTU]_Intrawell_APW-03	1	40.3
Turbidity, Field [NTU]_Intrawell_APW-03	1	56.1
Turbidity, Field [NTU]_Intrawell_APW-03	1	103
Turbidity, Field [NTU]_Intrawell_APW-03	1	50.7
Turbidity, Field [NTU]_Intrawell_APW-03	1	6.04
Turbidity, Field [NTU]_Intrawell_APW-03	1	2.72
Turbidity, Field [NTU]_Intrawell_APW-03	1	4
Turbidity, Field [NTU]_Intrawell_APW-03	1	7.12
Iron [mg/L]_Intrawell_APW-06S	1	9.35
Iron [mg/L]_Intrawell_APW-06S	1	9.18

group	D_report_result_value	report_result_value
Manganese [mg/L]_Intrawell_APW-06S	1	0.53
Manganese [mg/L]_Intrawell_APW-06S	1	0.512
Turbidity, Field [NTU]_Intrawell_APW-06S	1	30.5
Turbidity, Field [NTU]_Intrawell_APW-06S	1	15.1
Turbidity, Field [NTU]_Intrawell_APW-06S	1	5.56
Turbidity, Field [NTU]_Intrawell_APW-06S	1	6.67
Turbidity, Field [NTU]_Intrawell_APW-06S	1	9.06
Turbidity, Field [NTU]_Intrawell_APW-06S	1	8.99
Turbidity, Field [NTU]_Intrawell_APW-06S	1	1.26
Turbidity, Field [NTU]_Intrawell_APW-06S	1	3.32
Turbidity, Field [NTU]_Intrawell_APW-02	1	38
Turbidity, Field [NTU]_Intrawell_APW-02	1	19.2
Turbidity, Field [NTU]_Intrawell_APW-02	1	132
Turbidity, Field [NTU]_Intrawell_APW-02	1	93.6
Turbidity, Field [NTU]_Intrawell_APW-02	1	104.3
Turbidity, Field [NTU]_Intrawell_APW-02	1	97
Turbidity, Field [NTU]_Intrawell_APW-02	1	169
Turbidity, Field [NTU]_Intrawell_APW-02	1	104
Iron [mg/L]_Intrawell_APW-02	1	11.7
Iron [mg/L]_Intrawell_APW-02	1	7.63
Manganese [mg/L]_Intrawell_APW-02	1	0.752
Manganese [mg/L]_Intrawell_APW-02	1	0.669
Iron [mg/L]_Intrawell_APW-05/05R	1	2.77
Iron [mg/L]_Intrawell_APW-05/05R	1	5.89
Manganese [mg/L]_Intrawell_APW-05/05R	1	0.9
Manganese [mg/L]_Intrawell_APW-05/05R	1	0.554
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	51.8
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	9.19
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	4.65
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	8.21
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	42.6
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	33.7
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	76.1
Turbidity, Field [NTU]_Intrawell_APW-05/05R	1	38.9
Iron [mg/L]_Intrawell_APW-07	1	17.3
Iron [mg/L]_Intrawell_APW-07	1	18.9
Manganese [mg/L]_Intrawell_APW-07	1	1.11
Manganese [mg/L]_Intrawell_APW-07	1	1.19
Turbidity, Field [NTU]_Intrawell_APW-07	1	66.2
Turbidity, Field [NTU]_Intrawell_APW-07	1	34.8
Turbidity, Field [NTU]_Intrawell_APW-07	1	10.5
Turbidity, Field [NTU]_Intrawell_APW-07	1	79.2
Turbidity, Field [NTU]_Intrawell_APW-07	1	14.8
Turbidity, Field [NTU]_Intrawell_APW-07	1	42.9
Turbidity, Field [NTU]_Intrawell_APW-07	1	21
Turbidity, Field [NTU]_Intrawell_APW-07	1	4.36
Turbidity, Field [NTU]_Intrawell_APW-06D	1	18.5
Turbidity, Field [NTU]_Intrawell_APW-06D	1	74.4
Turbidity, Field [NTU]_Intrawell_APW-06D	1	26.9
Turbidity, Field [NTU]_Intrawell_APW-06D	1	181
Turbidity, Field [NTU]_Intrawell_APW-06D	1	65.5
Turbidity, Field [NTU]_Intrawell_APW-06D	1	3.02
Turbidity, Field [NTU]_Intrawell_APW-06D	1	18.2
Iron [mg/L]_Intrawell_APW-06D	1	3.65
Manganese [mg/L]_Intrawell_APW-06D	1	0.622

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2023 Grand Tower Energy Center Annual Inspection Report

PREPARED FOR
Rockland Capital, LLC

DATE
January 2024

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2023 Grand Tower Energy Center Annual Inspection Report

0599247

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CONTENTS

1. INTRODUCTION

Environmental Resources Management (ERM) Inc. is submitting the 2023 Annual Inspection Report in accordance with 35 Illinois Administrative Code (IAC) §845.550(a)(2) for the Grand Tower Energy Center (GTEC) facility located at 1820 Power Plant Rd, Grand Tower, Illinois (the "Site"). This report summarizes the results and findings of the GTEC quarterly post-closure coal combustion residuals (CCR) Impoundment inspection events during 2023. Copies of each CCR Impoundment inspection event, each of which contains an inspection form, a figure markup, and a photolog, for all four quarters of 2023, are attached as Appendix A.

2. BACKGROUND

GTEC historically operated as a merchant facility which sold energy into the Midcontinent Independent System Operator (MISO) distribution system and has been idled since late 2020. The immediate project site, south of the idled power generation facility, consists of an approximately 21-acre area consisting of an impoundment and associated drainage basin. The GTEC CCR Impoundment was capped and closed in 2020, and is subject to USEPA 40 CFR 257 and IEPA 35 IAC 845, as applicable. Approximately 235,000 cubic yards of CCR materials are present in the closed impoundment. These materials have been excavated, consolidated, and covered by a 40-mil LLDPE liner, cover soil, and geotextile liner which covers a 14-acre footprint within the site.

3. KEY ACTIONS COMPLETED DURING 2023

3.1 FIRST QUARTER 2023 INSPECTION SUMMARY

Ponding was noted in the drainage basin southwest of the impoundment. Erosion up to 9 inches deep was noted across the north, west, and southern CCR impoundment cap faces. Fence undermining repairs on were completed on the east-southeast side of the Site along the perimeter fence. Post-repair erosion control straw matting on the United States Army Corps of Engineers (USACE) levee has partially become detached. Growth of a limited but increased amount of woody vegetation (up to 1 inch in diameter) within the riprap on the north, west, and southern impoundment cap faces was observed. No significant degradation or other issues were noted associated with the closed CCR impoundment cover system. The ERM CCR Impoundment Inspector recommended removal of woody growth, repair of erosion channels, and re-installing straw matting on the USACE levee repair area.

3.2 SECOND QUARTER 2023 INSPECTION SUMMARY

Repairs to the USACE and GTEC levees continue to hold, and successful revegetation of levee face was reportedly progressing. Erosion was noted across north, west, and southern CCR impoundment cap faces up to 9 inches deep. The woody vegetation (up to 1 inch in diameter) noted to be within the riprap on the north, west, and southern impoundment cap faces during 2022 was treated with herbicide during Q1 2023. However, some live woody vegetation growth remained within the riprap. Ponding was noted in the southwest corner of the basin near the outfall. The impoundment cap was mowed during Q2 of 2023 and was found to be in generally

good condition. The Inspector recommended continued treatment of woody growth within the riprap with herbicide, and the filling of the erosional channels noted.

3.3 THIRD QUARTER 2023 INSPECTION SUMMARY

Repairs to the USACE and GTEC levees continued to hold, and successful re-vegetation of levee face reportedly continued to progress. Erosion was noted across north, west, and southern CCR impoundment cap faces up to 9 inches deep. Ponding was noted in the southwest corner of basin around the toe of the slope of the impoundment cap near the outfall. The impoundment cap was found to be in generally good condition. The Inspector recommended continued treatment of woody growth within the riprap on the impoundment cap with appropriate management methods such as brush hogging, mowing, cutting, herbicide applications, and the filling of the erosional channels noted.

3.4 FOURTH QUARTER 2023 INSPECTION SUMMARY

Repairs to the USACE and GTEC levees continued to hold, and successful revegetation of levee face continued to progress. Erosion was noted across north, west, and southern CCR impoundment cap faces up to 10 inches deep, an increase from the 9 inches deep reported during the first, second and third quarter inspections. Ponding continued to be noted in the SW corner of the basin near the outfall, although the amount of water was considerably reduced when compared to Q3 2023 observations. The impoundment cap was mowed during Q3 2023 and found to be in generally good condition. The Inspector recommended continued treatment of woody growth within the riprap on the impoundment cap with appropriate management methods such as brush hogging, mowing, cutting, herbicide applications, and the filling of the erosional channels noted.

APPENDIX A 2023 QUARTERLY CCR IMPOUNDMENT INSPECTION REPORTS

Grand Tower Energy Center
Closed CCR Impoundment
Quarterly Inspection Form

Date 03/03/2023

Time 1000-1200

Name Matt Halley
(Inspector)

Weather:

Temperature:
45 F

☐ Sunny
☒ Cloudy
☐ Raining
☐ Other

Observations:

☒ Erosion / Gullies
☐ Cracking / Sloughing
☒ Ponding / Damp Areas
☐ No Problems Identified
☒ Woody Vegetation Growth
☐ Other

Conditions Limiting Visibility:

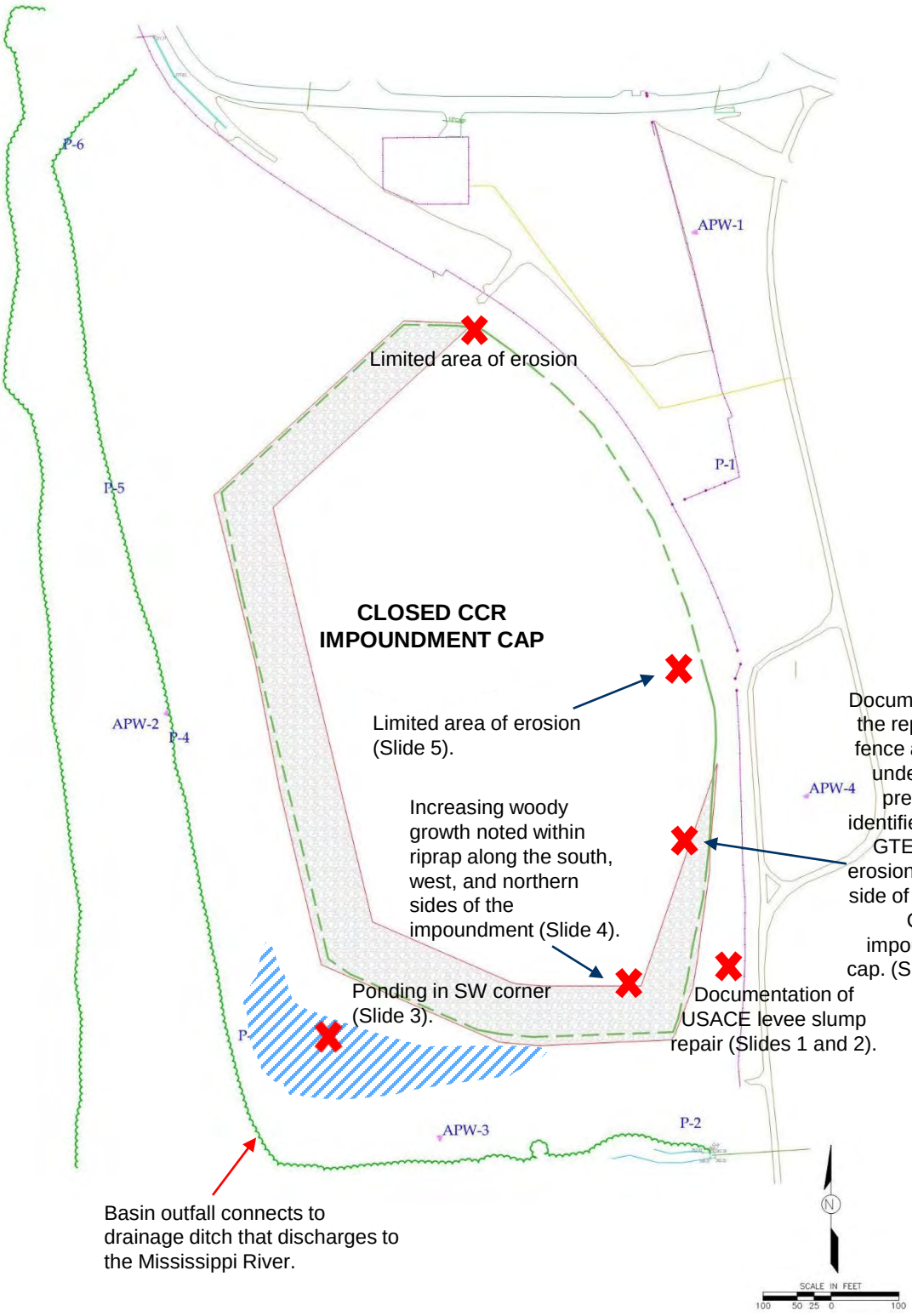
☐ Snow Cover
☐ Vegetation
☒ None
☐ Other

Observations in Detail Below:

- ERM onsite for the Q1 inspection of the closed CCR impoundment and groundwater sampling event.
- Completed repairs to the U.S. Army Corps of Engineers (USACE) Levee by Grand Tower Energy Center (GTEC) continues to be documented by ERM (see figure and photos).
- Completed repairs to the fence undermining on the east/SE side documented (see figure and photos).
- Post-repair erosion control measures (straw matting) on USACE levee has partially become detached.
- Erosion noted across north, west, and southern CCR impoundment cap faces up to 9” deep.
- Growth of a limited but increased amount of woody vegetation (up to 1”diameter) within the riprap on the north, west, and southern impoundment cap faces was observed.
- Ponding noted in SW corner of the basin near the outfall.
- Inspector recommends removal of woody growth, repair of erosional channels, and re-installing straw matting on the USACE levee repair area.

Please see observation locations on figure on the following page.

Observation Locations Map



Grand Tower Energy Center Q1 2023 Closed CCR Impoundment Cap Inspection - 3 March 2023

Repairs to the Levee and Fence Undermining on the SE Side of the Closed CCR Impoundment Cap

Facing east towards the repaired Grand Tower Energy Center (GTEC) and United States Army Corps of Engineers (USACE) levee area. Note: straw matting from repaired levee face has become partially detached and deposited at the bottom of the slope.

Repairs to the Fence and Riprap Undermining, and Levee erosion on the SE Side of Closed CCR Impoundment Cap

Facing north towards impoundment cap – repairs of fence and riprap undermining, and USACE levee section are visible.

Facing northeast towards repaired section of USACE levee.

Ponding in the SW Corner of Site Basin Near the Outfall

Ponded area in southwest corner of site as viewed from impoundment cap.

Note: Mississippi River backwater enters the GTEC CCR Impoundment Basin when the river level gage operated by the U.S. Army Corps of Engineers gage at Grand Tower, IL reaches a stage of approximately 27 ft.

Woody Growth Observations

Southern face of impoundment cap with woody growth (up to 1” diameter) within riprap. Increased woody growth since the third quarter 2022 found within riprap along south, west, and northern sides of the impoundment.

Erosional Channel Observations

Facing south on east side of impoundment cap.

Grand Tower Energy Center
Closed CCR Impoundment
Quarterly Inspection Form

Date: 6/26/2023

Time: 9:45-11:00

Name: Marshall Arendell
(Inspector)

Weather:

Temperature:
80 deg. F

☒ Sunny
☐ Cloudy
☐ Raining
☐ Other

Observations:

☒ Erosion / Gullies
☐ Cracking / Sloughing
☒ Ponding / Damp Areas
☐ No Problems Identified
☒ Woody Vegetation Growth
☐ Other

Conditions Limiting Visibility:

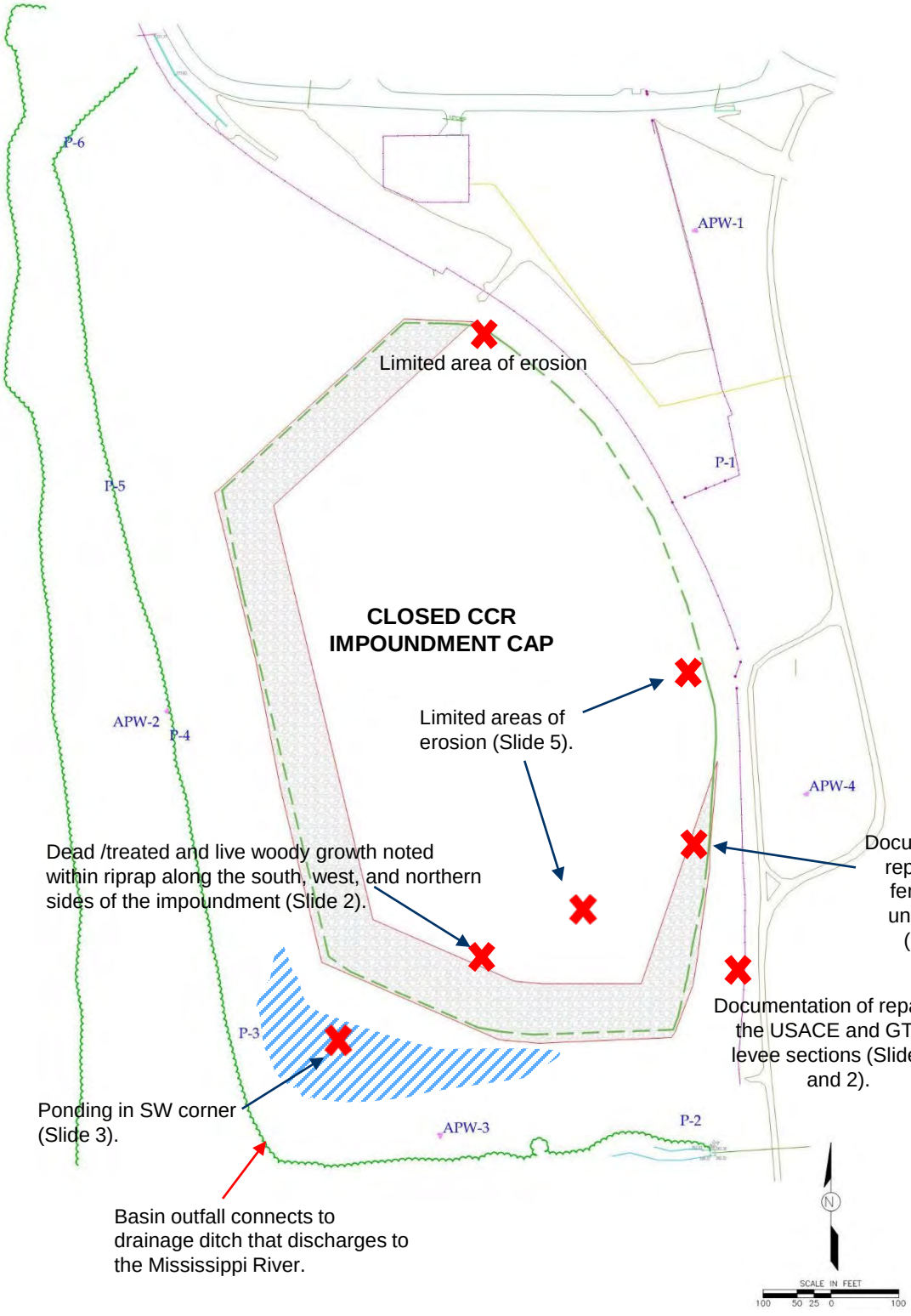
☐ Snow Cover
☒ Vegetation
☐ None
☐ Other

Observations in Detail Below:

- ERM onsite for the Q2 2023 inspection of the CCR impoundment and groundwater sampling event.
- Repairs to the United States Army Corps of Engineers (USACE) and GTEC levees continue to hold, and successful revegetation of levee face continues to progress.
- Erosion noted across north, west, and southern CCR impoundment cap faces up to 9” deep.
- The woody vegetation (up to 1”diameter) noted to be within the riprap on the north, west, and southern impoundment cap faces during 2022 was treated with herbicide during Q1 2023. However, some live woody vegetation growth remains within the riprap.
- Ponding continues to be noted in the SW corner of the basin near the outfall.
- The impoundment cap was mowed during Q2 of 2023 and found to be in generally good condition.
- The Inspector recommends continued treatment of woody growth within the riprap with herbicide, and the filling of the erosional channels noted above.

Please see observation locations on figure on the following page.

Observation Locations Map



Grand Tower Energy Center Q2 2023 Closed CCR Impoundment Cap Inspection

Repairs to the Fenceline and Levee area on the SE Side of Closed CCR Impoundment Cap

Facing south along the repaired fenceline, riprap, and levee area. Levee has successfully revegetated since repairs were initiated during 2022.

Repairs to the Levee erosion on the SE Side of Closed CCR Impoundment Cap and Woody Growth Observations

Facing east towards impoundment cap – dead/herbicide treated woody vegetation noted within riprap up to 1" diameter. Limited amount of live woody growth remains.

Facing northeast towards repaired section of USACE and GTEC levee sections.

Ponding in the SW Corner of Site Basin Near the Outfall

Ponded area in southwest corner of site as viewed from mowed impoundment cap.

Note: Mississippi River backwater enters the GTEC CCR Impoundment Basin when the river level gage operated by the U.S. Army Corps of Engineers at Grand Tower, IL reaches a stage of approximately 27 ft.

Erosional Channel Observations

Erosion up to 9” deep - facing east from center-east side of impoundment cap.

Erosion up to 9” deep - facing south from center-south side of impoundment cap.

Erosion up to 9” deep - facing southwest from southern side of impoundment cap.

Grand Tower Energy Center
Closed CCR Impoundment
Quarterly Inspection Form

Date: 9/19/2023

Time: 9:00-10:30

Name: Marshall Arendell
(Inspector)

Weather:

Temperature:
70 deg. F

☒ Sunny
☐ Cloudy
☐ Raining
☐ Other

Conditions Limiting Visibility:

☐ Snow Cover
☒ Vegetation
☐ None
☐ Other

Observations:

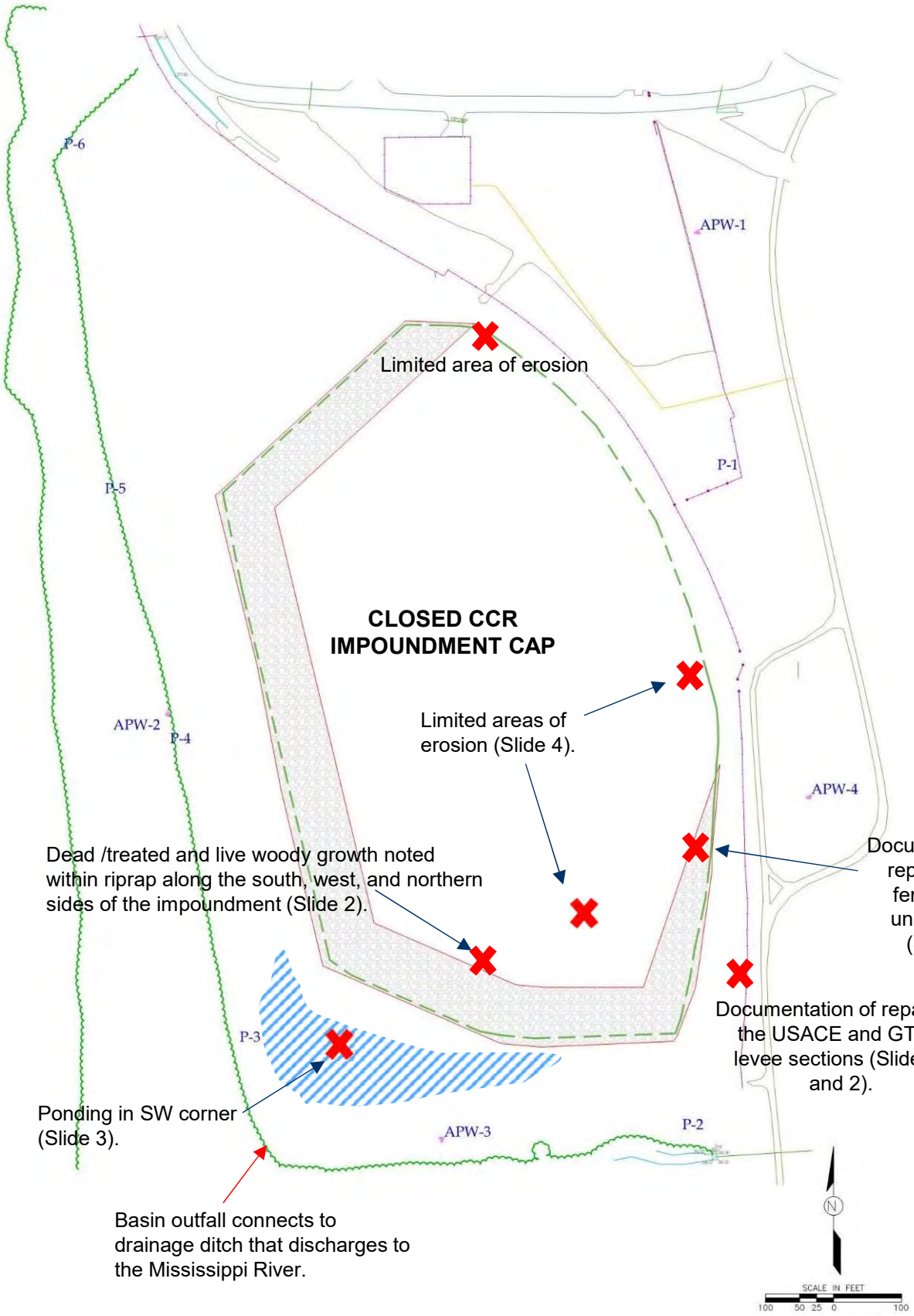
☒ Erosion / Gullies
☐ Cracking / Sloughing
☒ Ponding / Damp Areas
☐ No Problems Identified
☒ Woody Vegetation Growth
☐ Other

Observations in Detail Below:

- ERM onsite for the Q3 2023 inspection of the CCR impoundment and groundwater sampling event.
- Repairs to the United States Army Corps of Engineers (USACE) and GTEC levees continue to hold, and successful re-vegetation of levee face continues to progress.
- Erosion noted across north, west, and southern CCR impoundment cap faces up to 9” deep.
- Ponding continues to be noted in the SW corner of basin around the toe of the slope of the impoundment cap near the outfall.
- The impoundment cap was mowed during Q2 2023 and found to be in generally good condition.
- The inspector recommends continued treatment of woody growth within the riprap on the impoundment cap with appropriate management methods such as brushhogging, mowing, cutting, herbicide applications, and the filling of the erosional channels noted above.

Please see observation locations on figure on the following page.

Observation Locations Map



Grand Tower Energy Center Q3 2023 Closed CCR Impoundment Cap Inspection

Repairs to the Fenceline and Levee area on the SE Side of Closed CCR Impoundment Cap

Facing north along the repaired fence-line, riprap, and levee area. Levee has successfully revegetated since repairs were initiated during 2022.

Woody Growth Observations

Facing west towards impoundment cap.

Dead/herbicide treated woody vegetation noted within riprap up to 1” diameter. Limited amount of live woody growth remains.

Facing north towards impoundment cap.

Southern portion of the impoundment cap in foreground facing the southern berm and pond.

Ponding in the SW Corner of Site Basin Near the Outfall

Ponded area in southwest corner of basin near the outfall, as viewed from mowed impoundment cap.

Note: Mississippi River backwater enters the GTEC CCR Impoundment Basin when the river level gage operated by the U.S. Army Corps of Engineers at Grand Tower, IL reaches a stage of approximately 27 ft.

Erosional Channel Observations

Erosion facing southwest from southern side of impoundment cap.

Grand Tower Energy Center
Closed CCR Impoundment
Quarterly Inspection Form

Date: 11/29/2023

Time: 11:45-12:05

Name: Marshall Arendell
(Inspector)

Weather:

Temperature:
45 deg. F

☒ Sunny
☐ Cloudy
☐ Raining
☐ Other

Conditions Limiting Visibility:

☐ Snow Cover
☐ Vegetation
☒ None
☐ Other

Observations:

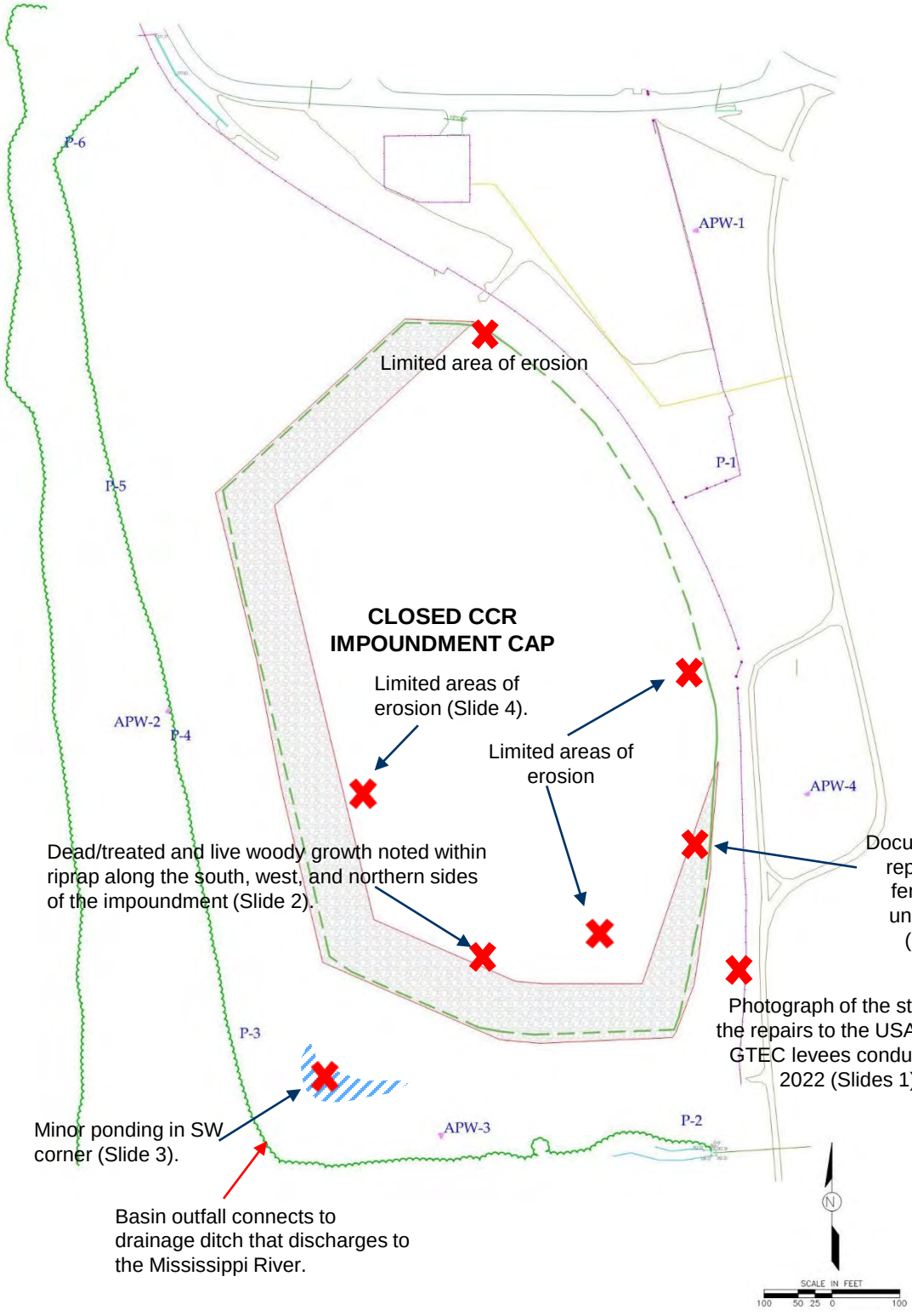
☒ Erosion / Gullies
☐ Cracking / Sloughing
☒ Ponding / Damp Areas
☐ No Problems Identified
☒ Woody Vegetation Growth
☐ Other

Observations in Detail Below:

- ERM onsite for the Q4 2023 inspection of the CCR impoundment and groundwater sampling event.
- Repairs to the United States Army Corps of Engineers (USACE) and GTEC levees continue to hold, and successful revegetation of levee face continues to progress.
- Erosion noted across north, west, and southern CCR impoundment cap faces up to 10” deep. This is an increase from 9" deep noted in previous inspection events.
- Ponding continues to be noted in the SW corner of the basin near the outfall albeit considerably reduced compared to Q3 2023 observations.
- The impoundment cap was mowed during Q3 2023 and found to be in generally good condition.
- The inspector recommends continued treatment of woody growth within the riprap on the impoundment cap with appropriate management methods such as brushhogging, mowing, cutting, herbicide applications, and the filling of the erosional channels noted above.

Please see observation locations on figure on the following page.

Observation Locations Map



Grand Tower Energy Center Q4 2023 Closed CCR Impoundment Cap Inspection

Repairs to the Fenceline and Levee area on the SE Side of Closed CCR Impoundment Cap

Facing south along the repaired fence-line, riprap, and levee area.

Facing northeast along the repaired fence-line, riprap, and levee area.

Levee has successfully revegetated since repairs were initiated during 2022.

Woody Growth Observations

Facing southwest towards impoundment cap.

Dead/herbicide treated woody vegetation noted within riprap up to 1” diameter. Limited amount of live woody growth remains.

Facing northeast towards impoundment cap.

Facing east away from impoundment cap.

Minor Ponding in the SW Corner of Site Basin Near the Outfall

Minor ponded area in southwest corner of basin near the outfall, as viewed from mowed impoundment cap. Note that ponding is much less than that noted in Q3 2023.

Note: Mississippi River backwater enters the GTEC CCR Impoundment Basin when the river level gage operated by the U.S. Army Corps of Engineers at Grand Tower, IL reaches a stage of approximately 27 ft.

Erosional Channel Observations

Erosion from western side of impoundment cap.

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